ASPIRATION IN ORIYA

ON

THE BASIS OF THE OBSERVER'S OWN PRONUNCIATION

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UTKAL UNIVERSITY

BHUBANESWAR, ORISSA

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THE OBSERVER'S OWN PRONUNCIATION WITH TEXTS IN PHONETIC TRANSCRIPTION

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PRINTED BY THE BAPTIST MISSION PRESS, CALCUTTA

BIOGRAPHICAL SKETCH

The author was born in 1921 in a village in Dhenkanal, Orissa. He took his B.A. (Hons.) degree in Sanskrit in 1943 and M.A. in 1945 from Patna University, securing first class in both. Besides, he was the best all-round graduate of Orissa (1943) and received various rewards and scholarships throughout his career.

He joined the department of Sanskrit and Oriya under the Government of Orissa (1945) and the School of Oriental and African Studies, University of London (1949), where he completed his M.A. in Philology in 1951. He received grants to participate in a seminar in France and to visit the U.S.A. in 1951.

He was on deputation to Agra University to serve as a Reader in Linguistics (1955–58) and was invited to teach in the summer schools of linguistics (1953–64) several times at Poona, Dehra Dun, Mysore and Dharwar and worked with eminent Indian and American linguists. He introduced phonetics in the I.A.S. training school, Delhi (1958–60), and directed several schools of phonetics for training school teachers at Puri (1964–66). He guided students for the Ph.D. degree in two universities.

He served on several linguistic committees of the Government of India and of the State Government of Orissa. He has published about 30 books (in Oriya, Hindi and English), five of which have won awards, some from the State Government and others from the Government of India.

ACKNOWLEDGEMENTS

I am grateful to the late Professor J. R. Firth who introduced me to this new discipline of linguistics and offered his very valuable criticism during the preparation of this work at the University of London. I remember with gratitude the encouragement I received from Dr. S. K. Chatterjee during his visit to London at that time.

I wish to express my grateful thanks to Professor W. S. Allen for his guidance and for the very special training he gave me in English phonetics.

I am indebted to all from whom I received training at the School of Oriental and African Studies and particularly to Mr. N. C. Scott, Mrs. E. M. Whitley and Mr. R. H. Robinson.

I owe to the Government of Orissa a debt of gratitude for having granted me a loan of Rs.14,000 without which my training abroad would have been impossible.

I gratefully acknowledge the generosity shown by the University Grants Commission and the authorities of Utkal University for providing funds for the publication of this work.

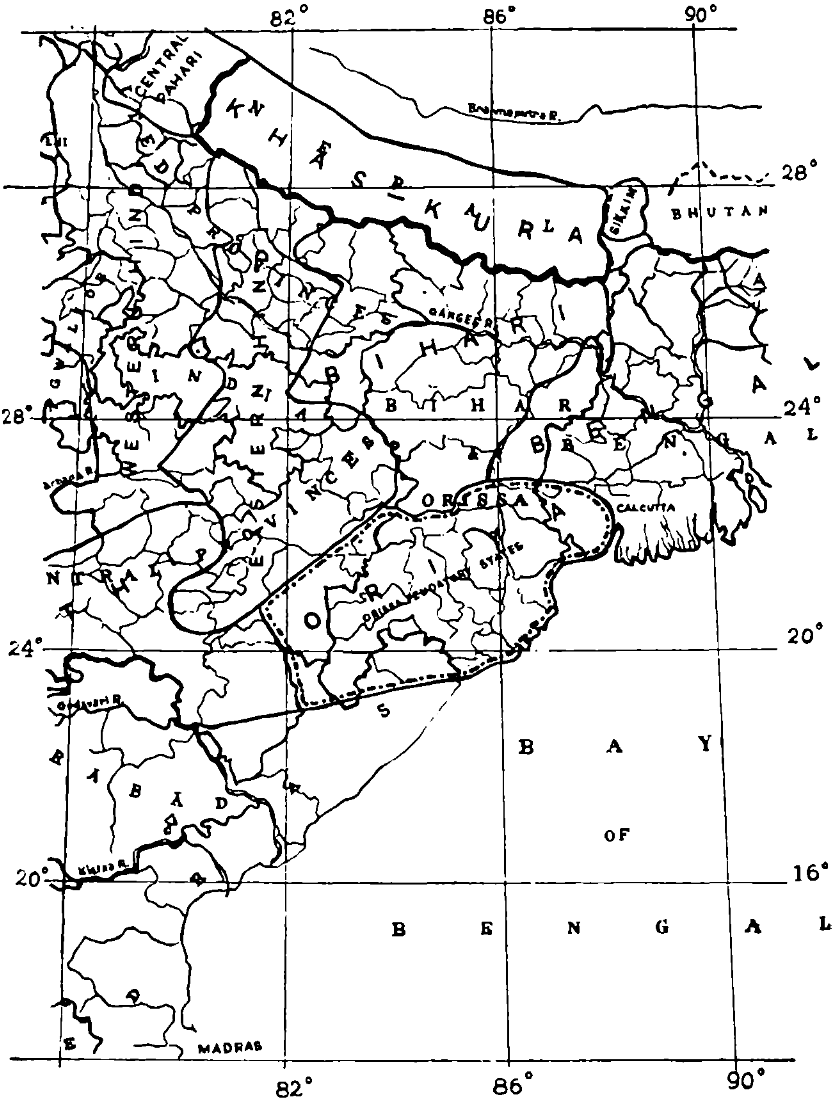
Finally, I wish to thank the authorities of the Baptist Mission Press, Calcutta, for having accepted to print the book which required special phonetic types and for having done the job very well.

G. B. D.

April, 1966

'All the principles of linguistic development and all the factors of evolution exist ready for our observation in the living speech of our own . . . dialects.'

H. C. WYLD
Historical Study of the Mother Tongue



Scale 1 inch = 160 miles

. . . . Provincial boundary
— · — · — · — · — Linguistic boundary

Map indicating the area in India where Oriya is spoken

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PREFACE

I came to London with a view to carrying on research in my own language, Oriya. After joining the Phonetics Department of the School of Oriental and African Studies, I enjoyed my acquaintance with phonetics which was an entirely new science for me. I then decided to do the phonetics of my own speech rather than the philology of the language.

At the beginning, I looked upon the phonetic studies involving a good deal of laboratory work with some surprise. But later on, I very much enjoyed my phonetics classes listening day after day with mechanical aids and trying to catch sounds of several languages I never heard before. What I enjoyed most is the romance of listening to my voice reproduced in the records I made. The difficult task of giving an over-all account of Oriya phonetics stands now begun, but little done. To my knowledge, this is the first attempt of submitting Oriya speech to the modern methods of phonetic analysis. The task only begins, and it will entail the services of many patient workers before the problems of that language are fully explored. I am anxiously waiting for the day when this science, so basic to linguistics, receives due recognition at home. It is now believed that the study of philology remains old-fashioned and sometimes misleading unless it is placed on a sound phonetic basis. The modern methods of phonetics, philology and linguistic sciences as a whole have gone far ahead of us; we in India must seize the opportunity of learning these methods or fall behind in a branch of learning which holds a high place in Indian tradition.

I worked in the phonetics laboratory of the Department for more than one year, and made use of the available experimental techniques. At the School I received instruction in principles of linguistics, and in the phonetics of some Dravidian languages, Sanskrit, Hindustani and English. I am grateful to all from whom I have received help and guidance during my stay at the School.

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May, 1951

Abbreviations

Asp.	Aspirated
Adj.	Adjective
ch.	chapter
colloq.	colloquial
Eng.	English
f.	feminine
imp.	imperative
km.	kymogram
M.I.A.	Modern Indo-Aryan
n.	noun
orthog.	orthography
pm.	palatogram
Pkt.	Prakrit
p.	page
pp.	pages
Romn.	Roman
Skt.	Sanskrit
syll.	syllable
v.	verb

Abbreviations of the Names of Books and Periodicals

B.S.O.A.S. ..	Bulletin of the School of Oriental and African Studies
T.P.S.	Transactions of the Philological Society
J.R.A.S.	Journal of the Royal Asiatic Society

INTRODUCTION

The Speaker and His Language

I am a speaker of Oriya, one of the major Indo-Aryan languages spoken by about twenty million people in the province of Orissa[1] and beyond it, in parts of Bihar, Bengal, Madhya Pradesh and Madras. The Oriya version of the name of the province 'Oḍiʃa'[2] and that of the people 'Oḍia' are etymologically connected with 'Oḍisu' (a Kanarese word meaning peasant) and 'Oḍrə' (the name of an ancient people) respectively. In spite of the dialectal variations and preponderating bilingualism[3] on borderlands, standard Oriya, of which I myself am a speaker, is easily understood everywhere. I was born and brought up in a middle class family in a village and educated in the town schools. As a lecturer in Oriya and Sanskrit in the college, I spend most of my time in educated society, and speak a style of Oriya which can be accepted as standard. The style of Oriya speech which I have submitted to phonetic analysis in this dissertation is consistent with the understanding of anybody who claims to speak Oriya. It is natural and unstudied but reasonably careful and not so rapid as in familiar conversation.

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[1] *See* frontispiece.

[2] *See* Binayak Misra: 'Oḍia Bhaṣara Itihasa', p. 16. *Also see* G. A. Grierson: 'Linguistic Survey of India', Vol. I, Part I, pp. 145–48, for an account of Oriya language.

[3] *See* T. C. Hodson: Bilingualism in India. *T.P.S.*, 1936, p. 85, with special reference to Orissa.

The Choice of the Subject and Treatment

Since Oriya speech is being submitted to phonetic analysis for the first time, it would have been much better to attempt an over-all account of the phonetics of Oriya. But a limited period of two years being considered too small for such a difficult task, I confined myself to only one feature of the language, namely aspiration. It is felt by the Indian linguists that aspiration is a prominent feature in the Indo-Aryan languages, and it will be interesting to watch its behaviour in the modern vernaculars. That was partly responsible for the choice.

It has been found convenient to treat aspiration as a prosody of the syllable rather than as a component of segmental phonematic units. Though treated as a prosody of the syllable, its phonetic realization, in many cases, involves not only one syllable, but the whole word in which the syllable occurs. Particular interest attaches to the fact that in quick, careless and also in connected speech aspirated syllables containing stop in certain contexts have been replaced by breathiness only (a word such as 'gɦənə' being realized in quick speech as **'ɦənə'**), i.e. the prosodic feature proving dominant over the phonematic stop feature. Further support for the prosodic treatment of aspiration is found in the fact that whereas the prosodics of nasalization and palatalization may be closed by a phonematic unit, they continue as a simultaneous accompaniment of aspiration (*see* under A. I(*f*), I(*b*) and A. I(*c*) in Dissyllables on pp. 56 and 54). Prosodic analysis which Professor Firth emphasizes in one of his articles[1] has thus been found useful in our treatment of aspiration. In speech the interpenetration of segments, the overlapping of the processes of voice, nasalization and aspiration are a commonplace of phonetics. Whatever

[1] *See* J. R. Firth. Sound and Prosodies. *T.P.S.*, 1948-49, pp. 141, and following.

units are found in analysis must be clearly related to the whole utterance—'We speak prosodies and listen to them'.

The approach may be broadly termed 'phonetic', but that covers two methods of statement:

(*a*) Phonetic in the narrower sense of a detailed description of the utterance as it is unrolled in the time track.

(*b*) Phonological functioning of certain features of the utterance (here aspiration) in relation to larger units, more especially the syllable.

I am inclined to feel that much of the interest lies in dissyllables, since majority of the native Oriya words belong to that pattern. Trisyllables and quadrisyllables mostly being compounds of independent morphemes do not show much interest beyond what is stated in dissyllables. The junction phenomena are less interesting in a language where every syllable is open and distinctly pronounced. Sir George A. Grierson rightly says that there are few of the 'slurred consonants and broken vowels which make a language difficult to speak correctly'.

Besides phonetic description, phonological formulae have been set up, within the framework of which aspiration can be described with maximum of economy. The phonological feature of aspiration has a wide variety of phonetic realization including breathy onset and closure, breathiness of vowel and continuants, breathy release of stops, affriction and friction.

The Use of Experimental Techniques

The description of events is based on kinaesthetic observations of my own speech, acoustic observation of recordings, and visual observation by mirror. It is supported by palatographic and kymographic evidences based on those techniques as are available in the phonetic laboratory of the School of Oriental and African Studies. A

number of palatograms and kymograms have been included, but it is not possible or advisable to put in all that has been attempted in the laboratory. The palatograms are arranged according to their order of occurrence in the thesis. A grid[1] has been supplied for measuring them. The order of the kymograms corresponds to that of their mention in the text within each of the following groups:

(*a*) Mouth tracings.
(*b*) Nose and mouth tracings.
(*c*) Larynx and mouth tracings.

Palatograms[2]

I used a very thin artificial palate that fitted me well and did not force me out of my natural speech habits. I worked with it for about a year. The palatograms of events were taken repeatedly at different dates, comparing them from time to time till each type of articulation could be satisfactorily located in an area without much variation. The new method[3] and improved technique[4] as are introduced by Professor Firth were applied in the investigation. Our palatograms are mainly concerned with the comparison of aspirated and non-aspirated syllables.

Kymograms[5]

Many speech events which could not be put to palatographic examination due to the presence of interfering

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[1] A grid is attached to the back cover.

[2] *See* Appendix.

[3] *See* J. R. Firth: Word-palatograms and Articulation. *B.S.O.A.S.*, XII, Parts 3 and 4, 1948.

[4] *See* J. R. Firth and H. J. A. F. Adam: Improved Technique in Palatography and Kymography. *B.S.O.A.S.*, XIII, Part 3, p. 771.

[5] *See* Appendix.

articulations could be examined on Kymograph. As a matter of fact the investigation is an attempt by means of a set of correlated techniques, each one of which makes its own specialized abstractions from the utterance. Tracings of the nose, mouth and the larynx have been taken. They have proved useful aids though by no means fully reflecting the processes of utterance. The letters printed under the kymograms are a guide to the identification of features of the tracing in their relationship to the description given in the text. But there is no attempt at showing, where one particular consonant or vowel begins or ends, since sounds slur into one another beyond all recognition of the point of demarcation.

Gramophone Records

I had made some records of my speech of my own language. They served the useful purpose of comparing sounds in different contexts, especially in junction.

It cannot be claimed that everything has been said about aspiration until the intonation of the language has received satisfactory treatment. But it is impossible to do anything of intonation at this stage in a language, where the basic phonetic analysis has hardly begun.

NOTE ON TRANSCRIPTION

In this type of dissertation, where the linguistic material lends itself to treatment on various levels, it is necessary to adopt some conventions to keep those levels visually apart, and make reading unambiguous. It has been found that aspiration in Oriya is best treated as a prosodic feature,[1] which cannot be adequately dealt with by linear phonetic transcription. For the purpose of identification of Oriya words, a mechanical letter-to-letter roman transliteration has been used. Below, the corresponding Oriya and roman symbols are set out (*see* p. 2).

As suggested above, a linear phonetic transcription is far from reflecting the exact realization of the prosodic features. This fact must be borne in mind when interpreting the I.P.A. transcription[2] (in bold type at the head of each discussion), which is intended only as a summary[3] of the features which are more adequately dealt with by the verbal description.

It may be noted that all vowels other than ଅ (ə) have two symbols each:

(i) When initial in syllables, e.g. ଆଦି (adi), ଖାଇ (kha-i).

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[1] For prosodic features, *see* J. R. Firth: Sounds and Prosodies. *T.P.S.*, 1948-49.

[2] For transcription by International Phonetic Alphabet, *see* The Principles of the International Phonetic Association published in 1949.

[3] *See* J. R. Firth: Phonological features of some Indian languages. Proceedings of the Second International Congress of Phonetic Sciences, 1935, p. 176.

Also see Bloomfield: Language, 84. 'Even his most "exact" record is bound to ignore innumerable non-distinctive features of sound.'

TABLE NO. 1

The table of Oriya symbols with roman transliteration by the side

Oriya	Roman transliteration	Oriya	Roman transliteration
Consonants		**Consonants**	
କ	ko	ବ	bə
ଖ	kho	ଭ	bho
ଗ	gə	ମ (୍ମ)	mə
ଘ	gho	ଯ (୍ୟ)	yo
ଙ	ŋə	ର (୍ର, ର୍)	rə
ଚ	cə	ଳ (୍ଳ)	ɭo
ଛ	cho	ଲ	lə
ଜ	jə	ଵ (୍ଵ)	wə
ଝ	jho	ସ	sə
ଞ	ɲo	ଶ	ʃə
ଟ	ʈo	ଷ	ʂo
ଠ	ʈhə	ହ	ho
ଡ	ɖo	କ୍ଷ	kʂo
ଢ	ɖho	**Vowels**	
ଣ	ɳə	ଅ	o
ତ (୍ତ)	tə	ଆ (ା)	a
ଥ	thə	ଇ (ି)	i
ଦ	də	ଈ (ୀ)	i:
ଧ	dho	ଉ (ୁ)	u
ନ (୍ନ)	no	ଊ (ୂ)	u:
ପ	pə	ଏ (େ)	e
ଫ	pho	ଐ (ୈ)	oi
		ଓ (ୋ)	o
		ଔ (ୌ)	ou

TABLE No. 2

The table of Oriya consonants and vowels based on traditional arrangement with roman transliteration by the side

	glottal	velar	palatal	retroflex	dental	labial
Unaspirated voiceless stops		କ kɔ	ଚ cɔ	ଟ ṭɔ	ତ tɔ	ପ pɔ
Aspirated voiceless stops		ଖ khɔ	ଛ chɔ	ଠ ṭhɔ	ଥ thɔ	ଫ phɔ
Unaspirated voiced stops		ଗ gɔ	ଜ jɔ	ଡ ḍɔ	ଦ dɔ	ବ bɔ
Aspirated voiced stops		ଘ ghɔ	ଝ jhɔ	ଢ ḍhɔ	ଧ dhɔ	ଭ bhɔ
Nasals		ଙ ŋɔ	ଞ ɲɔ	ଣ ṇɔ	ନ nɔ	ମ mɔ
Semi-vowels [1]			ଯ yɔ	ର rɔ, ଳ ḷɔ	ଲ lɔ	ୱ wɔ
Fricatives	ହ hɔ		ଶ ʃɔ	ଷ ʂɔ	ସ sɔ	
Compound consonant				କ୍ଷ kʂɔ		
Simple vowels [2]	ଅ ɔ ଆ a		ଇ i ଈ i: ଏ e	ଋ ṛ ୠ ṛ:	ଌ ḷ	ଉ u ଊ u: ଓ o
Diphthongs			ଐ oi			ଔ ou

[1] Treatment of these entries as semi-vowels is based on the phonological system of Sanskrit where we have ଋ(ṛ), ଌ (ḷ) vowels. In fact in Oriya only ଯ (yɔ) and ୱ (wɔ) would be treated as semi-vowels (i.e. consonants related in quality to the vowels i and u).

[2] Though in the earlier Sanskrit treatises ହ (h), ଅ (ɔ), ଆ (a) are classified as glottals (konṭhyɔ) in later treatises, both velar (jihvamuliyɔ) and glottal articulations are classified under the one title 'konṭhyɔ' which thus acquires a less scientific application analogous to the Western term 'guttural'.

(ii) When not initial in syllables, e.g. ଖାଡ଼ି (khadi), ଟିପ (ṭipə).

In Table No. 1 above form (ii) is enclosed in brackets: this form is combined with the symbols of the initial consonants of the syllable, e.g. ଖାଡ଼ି (khadi).

ଅ (ə) has no form to be used non-initially in a syllable. Where no vowel is indicated in the script, an inherent ə is implied.

Where a vowel makes a non-initial syllable by itself, it is transliterated with a preceding dash, e.g. ହଉ is written as hə–u, the dash being used to mark syllabic division.

A consonant with the sign ୍ (həḷəntə) below means that the consonant is realized without any following vowel, e.g. କ୍ is realized as **k** not as **kə**.

The signs in brackets ( ) shown against the consonants represent the forms of those consonants when used in consonant groups. The bracketed signs used for the semi-vowels ଯ (yə) and ୱ (wə) appear to be in each case the same, viz. ୍ୟ. But they can be distinguished by their position with regard to the consonant with which they are written. In the case of ଯ (yə), ୍ୟ is placed by the side of the consonant, and in the case of ୱ (wə) below it, e.g. kyə = କ୍ୟ and kwə = କ୍ୱ. There are two types of signs (୍ର) (ର୍) shown against ର (rə). For their use, *see* description under A. I(*e*) in Dissyllables, p. 52.

The sign ଁ (˜) placed over a vowel means that the vowel is nasalized, e.g. nasalized ଅ (ଅଁ) is represented as ə̃. The sign ଂ (˜) 'ənusvarə' functions in the same way as the sign ଁ.

It may be noted that the most frequently used Oriya vowel ଅ, which is transliterated as ə and phonetically transcribed as ə, has, in general, the quality of the half-open back vowel ɔ. Certain contextual variations have not been indicated in the present study. Some of the variations

will be evident from the narrow transcriptions of Oriya passages added at the end (*see* under Phonetic Texts, p. 120).

Method of Treating Aspiration

The realization of aspiration has been found in most cases to affect not a single phonematic position (segment) but a whole syllable (*see* A. I(*b*) (i) under Monosyllables, p. 18). This suggested the possibility of treating aspiration as a prosodic feature, not tied to a particular place in the syllable (*see* A. I(*d*) 2 (ii), p. 21). The treatment of aspiration as a syllable feature[1] involves setting up two opposed[2] categories of aspirated and non-aspirated syllables, within each of which it would be unnecessary to recognize any special series of 'aspirated' phonematic units. By abstracting the aspiration, it is possible to set up a system within which the relevant phonological features can be unambiguously described with a maximum of economy and minimum of symbols. We have already made a note on the method of representing the transliteration and phonetic transcription (on p. 1 and following) of our description. It here remains only to mention the method of presentation of phonological statements.

Method of Phonological Transcription

We make the following conventions for the generalized representation of Oriya syllable structure:

C	represents	consonants (in general)
V		vowels (in general)
P		voiceless stops
B		voiced stops
R	,,	non-nasal continuants

[1] *See* J. A. Henderson: 'Asia Major', Vol. I, Part II, 1949, p. 187.

[2] *See* A. Martinet: 'Phonology as Functional Phonetics', p. 11.

Y	represents	semi-vowel
N	,,	nasal continuants
Raised H	,,	aspiration
–	,,	a mark of syllabic division
⊙	,,	zero

An aspirated syllable will be signalled by ^{H} placed at the beginning of the syllables. In order to invest the prosodic symbol with non-linear character, we place it slightly above the line, e.g. hə, ghərə are represented as ^{H}*ə*, ^{H}*gə-rə*. While describing an example in the dissertation, we will present differently the three levels of analysis—transliteration of the Oriya orthography in roman within inverted commas, phonetic transcription in bold, phonological transcription in italic, and the meaning in terms of an English translation within inverted commas in roman :

e.g. gəphə 'talk', n. **gəphə** *gə-*^{H}*pə*

The statement of phonematic structure in terms of C and V is given in roman within inverted commas.

Let us now examine the syllabic structure of various types of Oriya words (*see* detail description under Syllabic Structure, p. 11) and see how far they fit into the system of phonological representation. The syllables, in general, are all open of the type V or CV. If they happen to be aspirated syllables, we can conveniently abstract the aspiration and represent them as ^HV or ^HCV. This system would, however, be uneconomical if it was found that an aspirated syllable of a particular phonematic structure (e.g. kaṭ) had in comparable grammatical contexts two different realizations corresponding to different dictionary entries (as in Hindi khaṭ/kaṭh), since one would then have to list the words, in which aspiration was realized as a breathy release of the first stop, and in which as a breathy release of the final.

In Oriya, however, the difficulty does not arise in view of the fact that nearly all syllables are open syllables (so

that, e.g. an aspirated syllable, **ka** could only be realized as **kha**). Apparent exceptions are relatable to specific grammatical categories, and there is no possibility of ambiguity in a prosodic statement. Let us examine the cases of apparent difficulty and discuss means of meeting them adequately.

Besides other types (to be described below), closed syllables in Oriya occur in the case of a few imperatives of the phonematic structure CVC where aspirated release may be associated with either the initial or final C. Take for instance the impolite imperative forms of some verbs:

Verb	Impolite forms
'talk'	**gəph**
'put'	**rəkh**
'realize'	**bujh**

Phonological representation of them as *ᴴgəp*
ᴴrək
ᴴbuj

would be misleading as it might well represent **ghəp**
rhək
bhuj

The impasse, however, is only apparent in that these words have in them the implication of their corresponding polite forms, e.g. **gəphə**, **rəkhə**, **bujhə**. For phonological purposes we can treat the impolite forms as (phonological) dissyllables with zero realization of the second sonant (ə), so

gəph (ə)
rəkh (ə)
bujh (ə)

may be stated as follows:

'**gəph**'–*gɔ-ᴴp*⊙	as against	'**ghoṭ**'–*ᴴgɔ-ṭ*⊙
'**rəkh**'–*rɔ-ᴴk*⊙	e.g.	'**thap**'–*ᴴta-p*⊙
'**bujh**'–*bu-ᴴj*⊙		'**bhaj**'–*ᴴba-j*⊙

We can generalize these two types of structure by the phonological formulae $CV\text{-}^{H}C\odot$ on the one hand and $^{H}CV\text{-}C\odot$ on the other.

The structure $CV\text{-}^{H}C\odot$ also covers some non-verbal forms attributed to the influence of Hindi pronunciation, e.g. **'labh'** (gain) is the Hindi type of pronunciation of the Oriya word **'labhə'** (*see* A. II(*h*) under Monosyllables on p. 41).

The other type of closed syllable of the structure VC **(uṭh)** can be treated as above with zero realization of the second sonant (ə) ($u\text{-}^{H}ṭ\odot$).

Another apparent difficulty is that some monosyllabic words in the language are formed with breathy onset and some with a breathy closure to a vowel.

Examples of breathy closure		Examples of breathy onset	
ih **uh** **oh** **eh** **ah**	exclamations of pain, ridicule or rejection	**he** **ho** **ha**	particles of address
		hu	noun

Both categories have one phonematic structure V. Within the class other than exclamations of pain, ridicule or rejection a statement ^{H}V will imply breathy onset, and within the class of exclamation of pain, ridicule or rejection breathy closure. To specify the latter class, we add the sign ! to the phonological structure. Examples of both the categories are given below:

e.g. ^{H}u = **hu**

$^{H}u\,!$ = **uh** (*see* pp. 14, 20)

The different categories of aspirated syllables in Oriya can be related to different categories of spelling in the Oriya orthography (*see* under Monosyllables on p. 13). It has therefore seemed appropriate to state two types of

categories in parallel as a heading for each section of our description.

Corresponding to the phonological category 'Aspiration without stop', the Oriya orthographic category is symbolized by ହ- hə; corresponding to the category 'Aspiration with stop', the orthography shows in the voiceless series ଖ, ଛ, ଠ, ଥ, ଫ (khə, chə, ṭhə, thə, phə) and in the voiced series ଘ, ଝ, ଢ, ଧ, ଭ (ghə, jhə, ḍhə, dhə, bhə); corresponding to the category 'Aspiration with continuants', the orthography shows for the nasals ହ୍ନ, ହ୍ମ (hnə, mhə) and for the non-nasal continuants ହ୍ର, ହ୍ଲ, ହ୍ୟ, ହ୍ୱ (hrə, lhə, hyə, hwə).

We have already set out the Oriya syllabary with one-to-one roman transliteration shown side by side. In Table No. 3 we have included only those symbols which mark aspirated syllables in Oriya. The arrangement

TABLE No. 3

The table of Oriya symbols representing aspirated syllables

(*See* Note on p. 61)

Aspiration without stop			ହ		
			hə		
Aspiration with voiceless stop	ଖ	ଛ	ଠ	ଥ	ଫ
	khə	chə	ṭhə	thə	phə
Aspiration with voiced stop	ଘ	ଝ	ଢ	ଧ	ଭ
	ghə	jhə	ḍhə	dhə	bhə
Aspiration with voiceless velar stop + semi-vowel					କ୍ଷ
					kṣə = khyə

is based on the order of treatment here adopted for descriptive purposes, i.e.

(i) Aspiration without stop,
(ii) Aspiration with voiceless stop,
(iii) Aspiration with voiced stop.

In Table No. 3, the Oriya letters are set out with the roman transliteration written below the corresponding Oriya letters.

A Note on the Method of Presentation of Description of Examples

For the sake of clarity and convenience we have divided the phonetic description of examples into three different parts :

(i) Description by perception, i.e. by hearing (from conduction and from records), by seeing (in a mirror), and by the kinaesthetic feeling of the speaker.
(ii) Kymographic support, if any, of the statements in (i).
(iii) Palatographic support, if any, of the statements in (i).

Instead of repeating the sub-headings each time, we will indicate the divisions only by marks (i), (ii), (iii).

Syllabic Structure

Before coming to the special treatment of aspiration which constitutes our main point of discussion, it will be necessary to give an account of the syllabic structure of various types of words in the Oriya language, since it was found that the minimum unit within which aspiration in Oriya can be adequately described is the syllable. The vocabulary of Oriya, like that of any other modern Indo-Aryan vernacular, draws its strength mainly from

Sanskrit by way of 'tədbhəbə' and 'tətsəmə'[1] words. By 'tədbhəbə', literally 'born from that', is meant those forms which have evolved from Sanskrit through the normal stages of linguistic development, e.g.

Skt.	M.I.A.	Oriya
kərtəri	kəttəri	kəturi (an instrument to cut with)
khadyə	khəjja	khoja (sweetmeat)

By 'tətsəmə', literally 'same as that', is meant those forms which are taken into Oriya straight from Skt. without change, e.g. 'guṇə' (quality), 'əbhyəntərə' (inside).

Besides these, words from various other sources such as other Indian vernaculars and foreign loans are every day infiltrating into and settling down in the language.[2] So whenever any attempt is made at systematic linguistic description, these foreign elements stand out as exceptions. One such case is provided by the syllabic structure of Oriya.

Excepting a few cases noted below, the syllables in Oriya are all open, the regular pattern being CV or simply V. Normally, therefore, a syllable is realized with a vocalic final and it is characteristic of the language that where no vowel is indicated in the script an inherent ə is implied (*see* Note on Transcription, p. 4, and also A. II(*d*), p. 30). The following are the examples of words of varying numbers of syllables:

ga	cv	(1 syllable)
ga-i-ba	cv-v-cv	(3 syllables)
ə-bhi-ni-jo-gə	v-cv-cv-cv-cv	(5 syllables)

[1] *See* 'Grammar of the Gaudian Languages'. Hoernle A. F. Rudolf, p. xxxviii.

[2] The common theory is that all languages are more or less mixed. The speaker of a particular language is hardly aware that he is using forms quite foreign to his language.

See J. Vendreyes: 'Language', pp. 288-89.

To this there are three categories of exceptions where closed syllables, i.e. (C)VC, may occur:

(*a*) Sanskrit 'tətsəmə' words,

(*b*) foreign loans, and

(*c*) a few monosyllabic imperatives and interrogatives.

It is to be noted that even Sanskrit 'tətsəmə' words which are written with double consonants and which in Sanskrit involved closed syllables[1] (e.g. kuk-ku-ʈə) are realized with single consonants in Oriya (e.g. ku-ku-ʈə). Examples of closed syllables in order:

(*a*) 'tətsəmə' words:	səd-bha-bə	cvc-cv-cv
	tət-pə-rə	cvc-cv-cv
	bə-ɭə-ban	cv-cv-cvc

(*b*) Foreign loans do not have the characteristic Oriya ə glide at the end of the word and may, therefore, have closed final syllables:

English loan	skul	ccvc	'school'
	əphis	v-cvc	'office'
Hindi loan	khub	cvc	'much'
Urdu loan	təphat	cv-cvc	'difference'
	phərək	cv-cvc	,,

(*c*) The few monosyllabic imperatives and rare interrogatives in Oriya constitute a separate class in that they have closed syllables, within the native structure of the language. The use of such imperatives implies a sense of intimacy, extreme familiarity, superiority and also impoliteness on the part of the speaker.

Examples:

Imperatives	rəkh	cvc	'place'	v. imp.
	uʈh	vc	'wake up'	v. imp.
Interrogative	keɳ	cvc	'what'	

[1] Close syllables are extremely common in Sanskrit and this was further strengthened by the process of gemination.

See Siddheshwar Varma: 'Critical Studies in the Phonetic Observation of Indian Grammarians', p. 63.

CHAPTER I

MONOSYLLABLES

As mentioned above (under Method of Treating Aspiration, p. 8), aspiration in Oriya may be conveniently described in categories parallel to its graphic representation in Oriya spelling. It will, however, be seen that the linearity suggested by the spelling is far from reflecting the phonetic state of affairs. We can describe aspiration in monosyllables under the following two headings:

I. Aspiration without stop.
II. Aspiration with stop.

Further, aspiration in both these categories can be treated in (A) in word isolates and in (B) in word junction. For the sake of convenience, the treatment of aspiration in (B) will be considered in an over-all treatment of word junction in all possible types of words (pp. 101 and following).

The following sub-categories form the basis of our description:

(A) WORD ISOLATES

I. *Aspiration without stop*

		Generalized phonological formula
(*a*) Syllables of		
Phonematic structure	V	
Orthog. ହ- (h-)		^{h}V

Generalized phonological formula

(*b*) Syllables of
Phonematic structure CV (where C is a non-nasal continuant) ^{H}RV

Orthog. ହ୍ର- (hr-)

(*c*) Syllables of
Phonematic structure V (with nasalization) $^{H}\tilde{V}$

Orthog. ହଁ- (h≃)

(*d*) Syllables of
Phonematic structure (C)V $^{H}V!$ (*see* below)
Orthog. -ହ୍ (-h)

In words of the last category (*d*) aspiration takes a different form from that in category (*a*) where the syllabic structure is identical. This might suggest at first sight that the abstraction of aspiration as a syllabic prosody would lead to ambiguous statement. For solution of the problem, *see* under 'Method of Treating Aspiration', on p. 8, where it has been shown that

^{H}u = **hu** (syllabic structure V category (*a*) here)
^{H}u ($^{H}u!$) = **uh** (syllabic structure V category (*d*) here)

II. *Aspiration with stop*

Generalized phonological formula

(*a*) Aspirated syllables containing voiceless stop
Phonematic structure CV
Orthog. ଖ-, ଛ-, ଠ-, ଥ-, ଫ-
(kh-, ch-, ṭh-, th-, ph-)
} ^{H}PV-

	Generalized phonological formula
(*b*) Aspirated syllables containing voiceless stop + non-nasal continuant Phonematic structure CCV *Orthog.* ଫ୍ର- (phr-) only	^{H}PRV-
(*c*) Aspirated syllables containing voiceless stop combined with nasal vowels Phonematic structure CV *Orthog.* ଖଁ- ଫଁ- (khṽ), (phṽ)	$^{H}P\tilde{V}$
(*d*) Aspirated syllables with implied dissyllabic alternant having aspirated second syllable with voiceless stop Phonematic structure CVC *Orthog.* ରଖ୍, ଗଫ୍ (rəkh), (gəph)	$CV\text{-}^{H}P(ə)$
(*e*) Aspirated syllables containing voiced stop Phonematic structure CV *Orthog.* ଘ-, ଝ-, ଢ-, ଧ-, ଭ-, (gh, jh-, ḍh-, dh-, bh-)	^{H}BV
(*f*) Aspirated syllables containing voiced stop combined with non-nasal continuants Phonematic structure CCV *Orthog.* ଘ୍ର-, ଧ୍ର- (ghr-, dhr-)	^{H}BRV
(*g*) Aspirated syllables containing voiced stop combined with nasal vowels Phonematic structure CV *Orthog.* ଭଁ- (bh≃)	$^{H}B\tilde{V}$

Generalized phonological formula

(*h*) Aspirated syllables with implied dissyllabic alternant having aspirated second syllable with voiced stop — $CV\text{-}^{H}B(\text{ə})$
Phonematic structure CVC
Orthog. ପଢ଼ (pəḍh)

As regards aspirated syllables with implied dissyllabic alternant having non-aspirated second syllables:

(i) Examples where the aspirated syllables contain voiceless stop, e.g. thap ($^{H}PV\text{-}B/P(\text{ə})$), will be dealt with under category (*a*) mentioned above (*see* p. 14).

(ii) Examples where the aspirated syllables contain voiced stop, e.g. ghot ($^{H}BVB/P(\text{ə})$), will be dealt with under category (*e*) mentioned above (*see* p. 15).

Detailed descriptions of the above categories follow in order, after a few general remarks on each of the broad headings I and II.

General Remarks on Heading I: Aspiration without Stop

In general it may be said that aspiration without stop (orthog. ହ (h)) in Oriya monosyllables is effected by a type of sound produced by the pulmonic air,[1] passing through the open glottis and mouth and having slight friction in the pharynx. It may, however, be said that the pharyngeal friction in my pronunciation of **h** is more perceptible than in that of others[2] to whom I had the

[1] *See* K. L. Pike: 'Phonetics', p. 89.

[2] In cases where comparison was necessary I often listened to my friend Dr. R. K. Das, M.B.B.S., who comes from my own place and is supposed to speak the type of Oriya I speak.

occasion to listen. I am inclined to say that this is due to greater amount of breath which lends a characteristic breathy quality to my voice in general. This general breathiness can easily be detected from listening to the records of my voice made from time to time.

The mouth is in position for the vowel[1] in the syllable and the soft palate is raised to form the velic closure. The breath is voiceless except when it takes the form of a breathy reinforcement of the subsequent vocalic vibration, when voicing and aspiration overlap and combine to produce a breathy vowel (*see* detail below). When not combined with a continuant it may be considered as a manner of initiating or terminating the vowel. It is generally described as a voiceless glottal fricative, though the relevance of the term glottal is problematic.

(*a*) *Syllables of phonematic structure V; orthog.* ಹ- (*h*-):

hu	'fire' colloq.	**hu**	*ʰu*
ho, he	'particles of address'	**ho, he**	*ʰo, ʰe*
hə	'yes'	**hə**	*ʰə*

(i) In these words written with initial h-, aspiration is realized as a breathy onset[2] to the vowels. For the description of aspiration, *see* 'General Remarks on Heading I: Aspiration without Stop', p. 16. It only remains to be added that during the formation of the sound the tongue is in position for the vowel. There are as many phonetic manifestations of aspiration as there are vowels bearing it. The aspiration towards its later part is realized as a breathy reinforcement of the vocalic vibration.

(ii) The km. tracing, No. 32 (hu), shows a gradual and very slow rise correlating with the slow expulsion of air.

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[1] *See* D. Jones: 'An Outline of English Phonetics', fifth edition, pp. 186, 777.

[2] *See* Potter, Kopp and Green: 'Visible Speech', p. 111. It is observed that **h** in this position is thought by many phoneticians to be a way of initiating a vowel rather than a sound entity.

The breath is voiceless (cf. also the larynx tracing of No. 32 (hu)). Both the mouth and the larynx tracings show great amplitude following the aspirated release, suggesting breathy reinforcement of the subsequent vocalic vibration.

It may be added that ho is also used in an entirely different context suggesting disapproval or unwillingness. In that case one can hear an audible friction of longer duration than in the case of ho meaning 'yes' as given above.

(*b*) *Syllables of phonematic structure CV (where C is a non-nasal continuant); orthog.* ཧྲ- *(hr-):*

hri	'shame'	**hri**	*^{H}ri*
hru	'a radical meaning to steal'	**hru**	*^{H}ru*
hra	'a radical meaning to be ashamed'	**hra**	*^{H}ra*

(i) In a few monosyllabic words quoted above where aspiration without stop is combined with a non-nasal continuant (the only possibility being an **r**), aspiration is realized as a vigorous puff of voiceless air expelled from the lungs, passing through an open glottis and mouth and accompanied by a succession of 3-4 taps by the tongue tip on the teeth-ridge producing a tapped **r** sound. Some breathiness is running throughout the utterance of the whole word (*see* 'Method of Treating Aspiration', p. 5). Sometimes the vocal chords begin to vibrate immediately the tongue tip is in position for **r** but at other times they do not vibrate until an appreciable time after the beginning of **r**. The taps of the **r** in combination with extra breath are more vigorous and numerous than those occurring in other contexts, e.g. **ri**.

(ii) The breath in '**hri**' is more energetic than in '**hi**', just as the **r** articulation is more energetic than in the '**ri**' (cf. km. tracings, No. 33 (hri) and No. 34 (hi)). The rise above the line in No. 33 (hri) corresponding to aspiration is higher than that in No. 34 (hi), suggesting greater energy in the breathforce. In km. No. 33 (hri)

the throw up above the line of the peaks corresponding to the tap release of **r** and the higher amplitude (than is found in the vowel contours of non-aspirated syllables) in the vowel section suggest that breathiness continues throughout the syllable. Compare km. No. 33 (hri) and No. 1 (ri), where the number of curves corresponding to the taps of **r** are greater (3) in (hri) than those (2) in (ri). The greater number of taps is due perhaps to the greater breathforce which keeps the tongue tip vibrating longer.

(c) *Syllables of phonematic structure V with nasalization; orthog.* ೕ- (*h*≃) *:*

hə̃	'yes'	**hə̃**	$^{H}\tilde{ə}$
hũ	'yes'	**hũ**	$^{H}\tilde{u}$
hẽ	'yes'	**hẽ**	$^{H}\tilde{e}$

(i) In these examples, aspiration is realized with a puff of breath passing through an open glottis and mouth. At the same time, the glottis gradually closing and the velum being very slightly lowered, some air passes through the nose before the beginning of the vowel. During the production of the vowel, for which the vocal chords vibrate and the velum is fully lowered, the breath passes simultaneously through the mouth and the nose. There is an alternative mode of aspiration in which the velic closure is complete and no air escapes through the nose until the beginning of the following vowel. This happens mostly in slow speech. In quick speech the breathy onset is strongly nasalized.

(ii) The km. tracing, No. 25 (hə̃), shows very few traces of vibration and rise above the line both in the mouth and the nose tracing at the same point in the time track, suggesting the simultaneity of aspiration with the process of nasality and voice. The higher amplitude both in the mouth and the nose tracing in the initial portion of the vowel section indicates the coincidence of maximal breath and nasality.

(d) Syllables of phonematic structure (C)V[1]*; orthog.* -ঽ *(-h):*

Words written with final -h are divided into three categories, as shown below:

(1) Words of exclamation of pain	ih	əh
	eh	oh
	uh	
(2) A few imperatives	rəh	
(3) Words of emphatic disapproval or rejection with glottal onset	əh	
	oh	

It may be noted that in categories (1) and (3) we have a set of orthographically identical words, i.e. əh and oh. But they are used in entirely different contexts as indicated above, in one case suggesting pain and in the other emphatic disapproval. The phonetic difference will be described below.

(*d*) (1) *Words of exclamation of pain:*

ih	**i̥i̥**	*ᴴi!*	əh	**əh**	*ᴴə!*
uh	**uu̥ˣφ**	*ᴴu!*	oh	**oh**	*ᴴo!*

(i) In these words aspiration is realized as a breathy closure to the vowel. The breath passing through the fully open glottis is voiceless. In each of the above sequences it has the characteristic resonance of the vowel contained in the syllable. The amount of lip-rounding necessary for 'uh' and 'oh' is greater than that for 'u' and 'o' in other contexts. In the case of 'ih' after the articulation of **i** the breath stream is still continuing in the oral resonance chamber (as for **i**) but without the accompaniment of voice. As such, the phonetic implication of 'ih' can be transcribed as **ii̥**. Though not truly palatal, it seems to me that there is an approach to palatal

[1] For the implication of this structure, *see* under 'Method of Treating Aspiration' on p. 8.

friction towards the end of the utterance. The same process of devoicing (as in **i̥**) towards the end of the utterance occurs in the case of realizing 'uh' with a modification[1] at the lips. Phonetically 'uh' can be transcribed as **uu̥ˣɸ**

(ii) With reference to the voicelessness of the breath, cf. km. tracings, No. 2, No. 3, No. 4 (əh, ih, uh). The tracings of 'ih' and 'uh' show higher amplitude and slow rise above the line in the later portion of the vowel sections, suggesting that towards their end vocalic vibrations are reinforced by extra breathiness.

(*d*) (2) *Rare imperative:*

rəh 'wait' (Imp.)	**rɦəh**	*rə·ᴴ*(ə)
	ʎɦəh	

(i) In this word aspiration is realized as a breathy closure to the vowel, in producing which there is an increase in the breathforce before the vocal chords have stopped vibrating, thus partly breathifying the vocal vibration of **ə**. **r** in this context can also be realized as a fricative (**ʎ**).

(ii) Cf. km. No. 5 (rəh). The lack of voicelike wave forms during the initial tap of **r** suggests that **r** is here realized partly as voiceless. The rise above the line corresponding to the taps of **r** and the subsequent high vocalic vibration suggest breathiness throughout the word (*see* 'Method of Treating Aspiration', p. 5). In linear representation of the word 'rəh' might thus be phonetically transcribed as **rɦəɦ**.

(*d*) (3) *Words of emphatic disapproval:*

əh	**ʔəh**	*ᴴə !*
od	**ʔoh**	*ᴴo !*

[1] *See* Kenneth L. Pike: 'Phonetics', p. 14.

(i) These words of disapproval are realized with a glottal onset[1] immediately on the release of which the vocal chords begin to vibrate, reinforced by an extra amount of breathiness and then draw completely apart allowing free passage of air through the mouth. The vowel in 'əh' is opener than 'ə' in non-aspirated monosyllables. In the case of 'oh' the lip-rounding is a feature of the whole utterance. The general impression of these utterances is that of a small cough.

General Remarks on Heading II : Aspiration with Stop

In phonemic analysis a distinction would have to be recognized between aspirated and non-aspirated stops in Oriya as serving to distinguish words at the lexical level. The two words for instance 'bagə' (manner) and 'baghə' (tiger) are distinguished by the absence or presence of an aspirated stop in them. This is a feature in common with Sanskrit and the M.I.A. languages in general. In recognition of this important feature, Indian languages provide distinct symbols in their orthography for aspirated and non-aspirated stops. So is the case in Oriya orthography. The phonetic descriptions of the aspirated and the non-aspirated, as 'məhapraɳə' (big breath air) and 'əlpəpraɳə' (small breath air) respectively by the Indian grammarians, emphasize the fact that the difference between them depends on the presence or absence of extra breath. It is the free flow of the pulmonic air through open glottis in case of voiceless aspirates and through partially open

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1 The articulatory difference between the two sets əh, oh and ʔəh, ʔoh mainly consists in what is called soft attack (leiser Einsatz of the Germans) in the case of the first set and hard attack (fester Einsatz) in the case of the second set.

See J. Vendryes: 'Language', p. 30.

glottis[1] in case of voiced aspirates that characterizes the aspirated stops. In the articulation of the aspirated stops, occlusion is made at the appropriate point in the buccal cavity and the air-passage is completely blocked. The air is then built up under pressure and is 'spitted out'[2] with the release of the occlusion. The release is thus accompanied by a strong outflow of audible breath. A higher buccal pressure[3] during the occlusion of the aspirated stops seems to be a fundamental characteristic of these sounds. It distinguishes them from the non-aspirated stops and is one of the factors which makes possible the heavy aspiration for the aspirated sounds. Phonetically an aspirated stop is a one-effort sound, not a stop plus aspiration as realized in the English compound 'top hat'. When an aspirated monosyllable begins with a stop, the aspiration takes the form of a breathy release of the stop and the release is voiced or voiceless according as the stop is voiced or otherwise. (*See* the detailed description below). The release is characteristically that of a stop but in some cases there is a tendency towards friction, specially with the stops of the labial (e.g. gəph) and velar series (e.g. rəkh) when the stops close the syllables. The release of the voiceless stop is more energetic and acoustically penetrating than that of the voiced stop in which the vibration of the vocal chords impede the flow of air. On examination of pms. of utterances of aspirated and non-aspirated syllables containing similar stops, it has been found that in some cases there is no suggestion of appreciable difference in tongue

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[1] *See* 'Practical Phonetics for Students of African Languages', p. 86. D. Westerman. Ida C. Ward.

[2] *See* J. R. Firth: 'Introduction to Colloquial Hindustani' by A. H. Harley, p. xix.

[3] *See* A. C. Sen: Experimental Study of the Bengali Occlusives. Proceedings of the Second International Congress of Phonetic Sciences, London, 1935, p. 189.

contact, e.g. between pm. No. 1 (ta) and No. 2 (tha), but in some other cases, there is some difference, e.g. pm. No. 3 (ja) and No. 4 (jha). Detailed description of them has been given where necessary in their proper place (*see* pp. 26 and 34).

The detailed description of aspirated syllables containing stop will follow in order of arrangement as found in the Oriya syllabary.

(*a*) *Aspirated syllables containing voiceless stop:*

Phonematic structure CV

Orthog. ଖ-, ଛ-, ଠ-, ଥ-, ଫ-
(kh-, ch-, ṭh-, th-, ph-)

Velar ଖ- (*kh-*)

kha 'eat' (Imp.) **k*ha** *Hka*

(i) Aspiration is here realized as a slow and breathy release to the initial velar stop. On release of the stop, the articulators separate less abruptly than is characteristic of the release of stops in general (*see* description of other series), and thus produce a slow release through a neighbouring fricative. The vowel is breathified.

(ii) For the greater degree of breathiness in the aspirated syllable than the unaspirated syllable containing similar stops, cf. kms. No. 6 (kha) and No. 7 (ka). With reference to the manner of release of the stop, cf. km. No. 6. In km. tracings the point of separation between a stop and its release can be indicated in the sound track by an abrupt throw up above the line (cf. kms. No. 8 (tha)) suggesting a sudden release. So the absence of any such sudden throw up and the presence of a slow and gradual rise above the line in km. No. 6 (kha) suggest the fricative nature of the release.

Palatals ଛ- (*ch*-)[1]

chu	'gone'	**chu**	*ᴴcu*
chi	'exclamation of reproach'	**chi**	*ᴴci*
che	'exclamation of reproach'	**che**	*ᴴce*

(i) In these words aspiration is realized as a breathy release of the initial affricated **c**, in the production of which occlusion is made by the front of the tongue in the post-alveolar region while the tongue tip lies behind the lower teeth. The tongue moves away from the point of occlusion giving rise to some friction. The friction in this Oriya affricate is less vigorous than that heard in the 'ch' of English 'church'. The vocal chords begin to vibrate while some extra breath is still continuing.

(ii) As a typical example of Oriya affricated stop, *see* km. No. 9 (chu) where the point of separation between the stop and the release cannot be located as it can be done in the case of an ordinary stop, cf. km. No. 8 (ṭha).

(iii) The pm. of 'chu', No. 6, indicates the area of contact in the post-alveolar region between canine and first molar line with bands of wipe-off on both sides extending to the base, cf. pm. No. 5 (cu), where the band of contact is wider and slightly advanced beyond the canine line.

Retroflex ଠ- (ṭh-)

ṭho	'the sound of giving a slap'	**ṭho**	*ᴴṭo*
ṭha	'royal meal'	**ṭha**	*ᴴṭa*

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[1] We have described ଛ (ch-) as an affricate but have preferred to transcribe the affricated element not by a diagraph tʃ which is the very common way of transcribing affricates, but by a single symbol c. c is used mostly in Indian works and also phonetically more appropriate here because the realization of the Oriya ଛ is more on the side of a plosive rather than affricate.

See D. Jones: 'The Phoneme: its Nature and Use', p. 5.

(i) These words are articulated by the edge or rim of the curled up tongue tip[1] against the hard palate. For the rest of the description they agree with the general remarks made on p. 22 under A. II, 'Aspiration with Stop'.

(ii) In km. No. 10 (ṭho) an abrupt and high kick above the line suggests the sudden release of the stop. Higher amplitude in the vowel section suggests that the vowel is breathified.

(iii) The pm. No. 8 (ṭha) shows a band of wipe-off much narrower than that in pm. No. 7 (ṭa). In (ṭha) the wipe-off extends from a point half-way between the third and the second molar lines into the post-alveolar region beyond the first molar line. But in (ṭa) it extends almost from the third molar line into the post-alveolar region far beyond the first molar line.

Dental ಥ- (*th-*)

tha	'stay on' Imp.	**tha**	*^{H}ta*
tho	'place' v. Imp.	**tho**	*^{H}to*
thu	'spitting' n.	**thu**	*^{H}tu*

(i) In these words aspiration is realized as a breathy release to a dental stop made by the rim of the tongue tip against the upper teeth and the blade behind the alveolar region. The oral occlusion is made complete by the sides of the tongue pressing against the upper teeth. The tongue is spread in the mouth.

(ii) For the presence of breathiness, *see* km. tracing No. 8 (tha). The energetic dental plosion is clearly suggested by the abrupt and high kick above the line.

(iii) *See* pm. No. 2 (tha): a wide band of wipe-off extends from the dental to the post-alveolar zone with narrow

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[1] My ṭ- articulations are in agreement with what is observed about the general nature of the articulation of similar sounds in Northern Indian languages.

See J. R. Firth: 'Introduction to A. H. Harley's Colloquial Hindustani', p. xix.

extension along the side to the base. The wipe-off suggests complete dental contact. The pm. No. 1 (ta) shows a very similar wipe-off with slightly less contact between the canine and first molar line.

Labial ꯐ- (*ph*-)

phi	'each', also Eng. loan 'fees'	**phi**	^{H}*pi*
phu	'a note of disregard'	**phu**	^{H}*pu*

(i) In these words aspiration is realized as a breathy release of a bilabial stop. The breath is strong and the release is characteristically that of a stop. Some of the released breathiness continues while the vocal chords are still vibrating for the vowel.

(ii) The aspiration/non-aspiration distinction can be clearly correlated with km. tracings, cf. kms. No. 11 (phi) and No. 12 (pi). The high and gradually descending throw up above the line corresponding to the aspirated release suggests greater breathiness than that is suggested by the very small kick in km. No. 12. The curves in the km. sections corresponding to the breathy release are not to be interpreted as suggesting any voicing. They may be due to the settling down of the scriber from the high kick.

Such monosyllabic loan words as 'phi' are very limited in the language. 'phi' is an English loan word meaning 'fees'. It has also a native homophone meaning 'each':

[1]thap 'place' v. Imp. **thap** ^{H}*ta-p*(ə)

Aspiration of the initial syllable is realized in a manner closely similar to that described above under A. II(*a*) Dental, on p. 26. The only articulatory difference consists in the fact that the dental occlusion made in this case is more firm than in other contexts, e.g. 'tha'.

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[1] *See* categories under A. II. Aspiration with stop (i) in monosyllables, on p. 16.

(b) *Aspirated syllables containing voiceless stop combined with non-nasal continuants*

Phonematic structure CCV

Orthog. ଫ୍ର- (phr-)

Combinations of aspiration with voiceless stop combined with non-nasal continuant in initial monosyllables are rare in Oriya. The one exception is provided by the word 'phri' and that itself is an English loan word meaning 'free', gradually becoming popular.

ଫ୍ର- (*phr-*)

phri 'free' **phr̥i** *ᴴpri*

(i) In the formation of this word there is first a complete occlusion made by both the lips. The air building up behind the occlusion is thrown out with the release of the stop and is accompanied by about four taps made by the tongue tip on the teeth ridge to produce the **r** sound. During the production of **r** the vigorous breath stream passes through the open glottis and mouth and continues for an appreciable time even after the vocal chords have begun vibrating. The **r** sound in this case is completely devoiced and the vocalic vibration partly breathified.

(ii) The high rise above the line of the peaks corresponding to the tap release of **r** in km. No. 13 (phri) suggests the presence of breathiness during its formation. **r** combined with a voiceless stop in an aspirated syllable is completely devoiced.

(c) *Aspirated syllables containing voiceless stop combined with nasal vowels*

Phonematic structure CV

Orthog. ଖଁ (khṽ)

There is no instance in the language where a stop combines with a nasal consonant in an aspirated monosyllable in Oriya. Even combination with nasal vowels

are very few. Some instances are available in the velar and labial series, the description of which follows.

Velar ଖଁ- (*kh*≃)

khā̃ 'a Muslim surname' **kˣhā̃** *ᴴkā̃*

(i) This word is formed by a velar stop, on the slow release of which a strong stream of voiceless breath passes through the mouth. When some breath has already passed, the soft palate is slightly lowered allowing some breath to escape through the nose. While the vocal chords are vibrating, the nasal passage is completely open allowing most air to pass through it. A distinct nasal resonance is added to the vowel. In quick and careless speech this stop tends to be replaced by a velar fricative. An aspirated syllable with stop of this series with a close front vowel has less nasal resonance than that of '**khā̃**' where the nasal quality is more pronounced.[1]

(ii) For simultaneous escape of air through the mouth and nose, cf. km. No. 26 (khā̃). For comparing the duration of nasality in 'khā̃' and 'khī', *see* km. tracings No. 26 and No. 27. The rise above the line in the nose tracing runs parallel with the section corresponding to breathiness in the mouth tracing for a greater length in 'khā̃' than in 'khī'.

Labial ଫଁ- (*ph* ≃)

phə̃ 'the hissing sound of a snake' **phə̃** *ᴴpə̃*

(i) The word 'phə̃' is realized with a bilabial stop. The release of the stop occurs simultaneously with the slight lowering of the velum and a stream of voiceless breath escapes through the mouth and the nose. While the vocal chords are vibrating, the nasal passage is fully open, allowing a greater amount of air to escape through the nose, adding a distinct nasal quality to the vowel. As in the syllable containing a velar stop (kh-), in quick

[1] Cf. Alfred Ewert: 'The French Language', p. 39.

and careless speech, this sound tends to be realized as a fricative, i.e. bilabial fricative ϕ.[1]

(*d*) *Aspirated syllables with implied dissyllabic alternant having aspirated second syllable with voiceless stop*

Phonematic structure CVC

Orthog., e.g. ରଖ୍ (rəkh) ଗପ୍ (gəph)

Oriya monosyllables of the structure CVC belong to a particular category of words, i.e. imperatives used impolitely. The corresponding polite forms differ phonetically in having the characteristic final ə glide (*see* under Syllabic Structure, p. 11), as a result of which the words become dissyllabic.

Examples:

Impolite form		*Polite form*	
rəkh	(keep)	**rəkhə**	(please keep)
uʈh	(wake up)	**uʈhə**	(please wake up)

The impolite forms also have a different tone pattern from that of the polite ones,

e.g. **rəkh** ╲ **rəkhə** · —
uʈh ╲ **uʈhə** · —

We have examples of aspiration with voiceless stops in monosyllables of all series except the dental.

Examples:	velar	rəkh	'keep'
	palatal	poch	'wipe off'
	retroflex	uʈh	'wake up'
	labial	gəph	'speak on'

[1] *See* A. C. Sen: Experimental Study of Bengali Occlusives. Proceedings of the Second International Congress of Phonetic Sciences, London, 1935, p. 185.

'It may be noted that the "ph" behaves differently from others as the rate of speed increases. At a quick speed of four syllables per second, there is a continuous flow of air from the mouth and the occlusive "ph" becomes a fricative.'

In their phonetic realization these impolite examples share the common features as detailed below:

(i) In the later part of the vowels aspiration is represented as a breathy reinforcement of the glottal vibration, cf. km. No. 14 (poch) and No. 15 (uṭh).

(ii) The breathy release of the final stop is voiceless.

(iii) When we compare the polite forms with the impolite counterparts, e.g. 'uṭhə', with 'uṭh', it is invariably found that the first vowel in 'uṭhə' has no breathiness, cf. km. tracings No. 15 and No. 16.

Velar -ಖ್ (*-kh*)

rəkh 'keep' Imp. **r$ə^{ɦ}$**[1]**k^{x}** *rə-^{H}k(ə)*

(i) Aspiration in the word 'rəkh' is realized as a breathy release of a velar stop. There is voiced breathiness in the vowel and voiceless breathiness in the release of the stop. The fricative nature of the release of the stop in this position is much clearer than that in the initial or medial position (*see* A. II(*a*), Velar, pp. 24, 69). The difference is best heard by comparing the pronunciation of 'rəkh' with that of 'kha' or 'rəkhə'. 'rəkh' might be narrowly transcribed as **r$ə^{ɦ}$k^{x}**.

Palatal -ಛ್ (*-ch*)

poch 'wipe off' Imp. **poch** *po-^{H}c(ə)*

(i) In the realization of this word the breathiness in the vowel is negligible compared with that in the vowel of 'rəkh'. The final stop is realized in a manner closely similar to that described under A. II(*a*), Palatals, on p. 25.

(ii) The comparison of pms. No. 11 (poch) and No. 12 (pochə) suggests similar tongue contact. The only difference is that in poch the wipe-off in the central portion

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[1] In this text, in the narrow transcription, the raised 'h' indicates breathiness less than that associated with fully aspirated syllables.

of the palate reaches up to a point in the alveolar zone beyond the canine line. But in pocho at one point the wipe-off is more advanced towards the lateral incisor line.

Retroflex -ಠ್ (-*ṭh*)

uṭh 'wake up' Imp. **u$^{\wedge}$ḍ̥h** *u-^{H}ṭ(ə)*

(i) In realizing this word the articulation of 'u' involves greater lip-rounding than it has in other contexts. The articulation of 'ṭh' in this case has less sharp release than that of 'ṭh' in 'uṭho' (the corresponding polite form of 'uṭh'). The presence of breathiness in the vowel is more clearly felt than in the case of 'poch'.

(ii) cf. km. tracings No. 15 (uṭh) and No. 16 (uṭhə). In No. 16 comparatively high kick above the line corresponding to the stop suggests energetic articulation. But in the corresponding section in No. 15 (uṭh) we find very small kick suggestive of comparatively weak articulation. In the same tracing, No. 15, very high amplitude immediately preceding the stop section indicates considerable amount of breathiness in the vowel.

(iii) The area of tongue contact for the stops both in the polite and impolite forms is about the same. The band of wipe-off for 'uṭhə' is slightly narrower on one side than that for 'uṭh'. (*See* pm. No. 10 (uṭhə) and pm. No. 9 (uṭh)).

Labial -ಫ್ (-*ph*)

gəph 'speak on' Imp. **gəph** or **gəϕ** *gə-^{H}p(ə)*

(i) In the word 'gəph' aspiration can be realized in two different ways:

(1) As a breathy release of a final stop (**ph**), and
(2) as friction.

The second type of pronunciation is more natural with me.

(*e*) *Aspirated syllables containing voiced stop*

Phonematic structure CV

Orthog. ଘ-, ଝ-, ଢ-, ଧ-, ଭ-

gh-, jh-, ḍh-, dh-, bh-

Aspirated syllables, containing voiced stops in their phonetic realization, share the following common features:

(i) Vibration of the vocal chords even during the stop.

(ii) Escape of air through the nose simultaneously with the release of the stop.

It may be noted that there is actually no lowering of the velum in this case to allow the escape of air through the nose, as is normally the case in producing a truly nasal sound. All that happens is that the contact of the velum with the pharynx is rather loose, and some vibration is conducted through the velum into the nasal cavity. It is rather a physiological phenomenon associated with aspiration with voiced stop,[1] but has no linguistic significance in Oriya.

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[1] *See* R. H. Stetson: 'Motor Phonetics', p. 56, in Archives Néerlandaises de Phonétique Expérimentale, Tome III, where Stetson cites Musehold A. Akustik and Mechanik des Menschlichen Stimmorgane, Springer, Berlin '13, p. 51.

'The movement of most of the consonants is more complex than ordinarily assumed. Either by direct action of the vocal chords or by their indirect control, all the consonants are either voiced or unvoiced. In addition to this complication it has long been recognized that the soft palate must be closed for all consonants except "m" and "n". An accurate analysis adds to "m" and "n", "b, d, g", for each of which the soft palate is momentarily lowered. "b, d, g" are occlusive sonants for which some release of mouth pressure is necessary for flow of air through vocal chords.'

This problem was noted by Rousselot, who uses the term 'nasalite anormale' for this type of nonsignificant nasalization. *See* Rousselot: Principes de Phonétique Expérimentale, Tome I, Paris 1924, pp. 527–534. *Supra* Chap. II(d), f.n. 2.

Velar ঘ- (*gh-*)

gha	'wound'	**gɦa**	*ʰga*
ghu	'sound of blowing wind'	**gɦu**	*ʰgu*
gho	'a big noise'	**gɦo**	*ʰgo*

(i) In these words aspiration is realized as a breathy release to a voiced velar stop during which the vocal chords begin to vibrate and continue till the end of the words. On the release of the stop, a clearly audible puff of voiced breath is forced out. During the formation of the vowel, the vibration of the vocal chords is reinforced by breathiness.

(ii) In km. tracing No. 35 (gha) very clear vibration on the larynx tracing at the same points on the time track corresponding with the stop section in the mouth tracing indicates voicing during the stop. The high amplitude in the vowel section of the mouth tracing and marks of vibration in the larynx tracing at the same place on the time track suggest the overlapping of the two processes of voicing and aspiration.

Palatal ଝ- (*jh-*)

jha 'a family name' **jɦa** *ʰja*

(i) In this word aspiration is realized as a breathy release to an affricated stop (*see* description of 'ch' in A. II(*a*), Palatals, p. 25). The presence of voice is the only differentiating feature in this case. The friction in the case of Oriya affricates is less vigorous than that heard in the realization of 'j' in English words, e.g. **ʤʌʤ** (judge) or **ʤenrəl** (general).

There is no genuine Oriya monosyllable containing ଝ- (jh-). The example quoted above is a Hindi word used by the Oriyas.

(iii) The pm. No. 4 (jha) shows a band of wipe-off in the post-alveolar region extending on both sides up to the base of the palate. Cf. pm. No. 3 (ja) in which the

band of wipe-off is somewhat wider and reaches far into the alveolar region.

Retroflex ଢ- (*ḍh-*)

ḍhi	Onomatopoeic words commonly used to represent firing of a gun	**ḍɦi**	^{H}*ḍi*
ḍhu		**ḍɦu**	^{H}*ḍu*
ḍho		**ḍɦo**	^{H}*ḍo*

(i) Aspiration in these words has similar realization to that of ṭh described under A. II(*a*), Retroflex, p. 25. The main differentiating feature is the presence of voice in this case.

(ii) Cf. km. tracing No. 17 (ḍhi). Minute traces of vibration in the section corresponding to the stop suggest the presence of voice in it.

(iii) The band of wipe-off for 'ḍhi' in pm. No. 14 extends from a point between the second and the third molar line (nearer the latter) right up to the canine line. There is wide wipe-off along the sides up to the base. Cf. pm. No. 13 'ṭhi' in which the wipe-off on the whole is slightly bigger; more on the sides than in the centre.

Dental ଧ- (*dh-*)

dhə	'catch' Imp.	**dɦə**	^{H}*də*
dha	'root meaning to wear'	**dɦa**	^{H}*da*

In these words aspiration is realized as a breathy release to a voiced dental stop. It has a realization similar to the breathy release of a voiceless dental stop, as described in A. II(*a*), Dental, on p. 26. The only outstanding difference here being the presence of voice.

Labial ଭ- (*bh-*)

bhu	'earth'	**bɦu**	^{H}*bu*
bhi	a radical meaning 'to fear'	**bɦi**	^{H}*bi*
bho	'the bark of a dog'	**bɦo**	^{H}*bo*

(i) The aspirated syllable containing a voiced bilabial stop in the above words has a realization similar to the aspirated syllable containing voiceless bilabial stop (phi) described in A. II(*a*), Labials, on p. 27. The difference between them is the presence of voice in the former and the absence of it in the latter. In quick and careless speech 'bh' may be realized as a bilabial fricative phonetically represented as β.[1]

ghoʈ[2] 'triturate' **gɦoʈ** *^{H}go-ʈ(ə)*

Aspiration of the initial syllable is realized in a manner closely similar to that described above under A. II(*c*), Velar, on p. 34.

(*f*) *Aspirated syllables containing voiced stop combined with non-nasal continuants*

Phonematic structure CCV

Orthog. ଘ୍ର-, ଧ୍ର-
ghr-, dhr-

The combination of voiced stop combined with non-nasal continuants in aspirated syllables does not occur within the native structure of the Oriya language. There are only three words of such combination, each of them belonging to a different series, e.g. 'ghra' (velar), 'dhru' (dental), 'bhru' (labial). They are Sanskrit radicals used in the grammatical analysis of 'tətsəmə' words found in the language. Among the non-nasal continuants **r** is the only member susceptible to such combination. Uneducated people often realize these combinations with an anaptyctic vowel (known as 'svərəbhəkti',[3] i.e. vowel fragment) placed in

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[1] Cf. S. K. Chatterjee: (*a*) 'Origin and Development of Bengali Language', pp. 441–43; (*b*) 'Brief Sketch of Bengali Phonetics', para. 30; (*c*) 'Baŋgla Bhaşatəttvər Bhumika', p. 202 (written in Bengali).

[2] *See* categories under A. II. Aspiration with stop (ii), on p. 16.

[3] *See* S. Varma: 'Critical Studies in the Phonetic Observation of Indian Grammarians', Chap. VII, p. 133.

between the two members. Detailed description of the combination follows in serial order.

Velar घ्र- (*ghr-*)

ghra a radical meaning 'to smell' **gɦra** *ᴴgra*

(i) This word is realized with an initial velar stop during the formation of which the vocal chords begin to vibrate. With the release of the occlusion is forced out a puff of voiced breath, accompanied by a succession of taps (**r**) made by the tongue tip in the alveolar region. During the production of **r**, and the succeeding vowel **a**, the vigorous puff of voiced air continuing through the mouth makes the **r** both breathy and voiced, and the vowel breathified.

It may be added that **r** behaves consistently in three different contexts:

(*a*) aspiration without stop combined with **r** (hr),
(*b*) aspiration with voiceless stop combined with **r** (phr),
(*c*) aspiration with voiced stop combined with **r** (ghr),

in having breathiness and about the same number of taps (3-4). But so far as the voice is concerned **r** is inconsistent in the case of realization of:

(*a*) —(hr) partly voiced and partly voiceless,
(*b*) —(phr) completely voiceless,
(*c*) —(ghr) fully voiced.

(ii) For the comparison of the three features (taps, breathiness and voice) of **r** just mentioned, *see* kms. No. 33 (hri), No. 13 (phri), and No. 18 (ghra). The very high amplitude of the vocalic vibration in km. No. 18 (ghra) suggests the presence of considerable amount of breathiness in the vowel.

Dental ध्र- (*dhr-*)

dhru a radical meaning 'to hold' **dɦru** *ᴴdru*

(i) The word 'dhru' is realized with an initial dental stop, characterized with a strong breathy release. On

the release of the occlusion, the body of the tongue is immediately drawn back and taps are made by the tongue tip to produce the **r.** The point of articulation of **r** in this case is further forward than in the case of 'ghra'. The vocal chords are vibrating even before the release of the stop till the end of the word and a strong breath stream passes through the mouth during the articulation of **r** and the vowel **u.**

Labial ଭ୍ର- (*bhr-*)

bhru a radical meaning 'to fill' **bɦru** *ᴴbru*

(i) The word 'bhru' is made with a bilabial stop, the release of which is characterized by strong audible breath, and is accompanied by a succession of taps **(r)** made at the teeth ridge by the tongue tip. Voicing and breathiness occur simultaneously making **r** and **u** both voiced and breathified. The articulation of 'bhru' is more energetic than that of 'bhu'. A lazy or weakened articulation of 'bhu' may have a fricative realization **βu** but 'bhru' does not have any fricative alternative.

(ii) For the overlapping of the two processes of voicing and aspiration, cf. km. tracing No. 19 (bhru).

In summarizing the results of aspirated syllables containing voiced stop combined with non-nasal continuant combination as described above, these outstanding features may be noted:

(1) The number of taps of **r** in these combinations is greater (3-4) than those of the same in other contexts, (2 taps) in the case of '**ri**'. *See* km. No.1.

(2) The overlapping of voice and breathiness in the vocalic element is considerable.

(3) The stop has a breathy release, the continuants and the vowels have overlapping voice and breathiness. Hence aspiration is found to be realized as a feature of the whole syllable rather than the component of any segmental phonematic unit.

(*g*) *Aspirated syllables containing voiced stop combined with nasal vowels*

Phonematic structure CV

Orthog. ଘଁ-, ଭଁ-
(gh ≃), (bh ≃), etc.

Monosyllabic words of this category are very limited in the language. Except the one representing the dental series (dhã), all other examples belong to the class of onomatopoeic words. 'dhã' (meaning 'run') is the only example of imperative having a nasal vowel in it. Detailed description follows in serial order:

Velar ଘଁ (*gh* ≃)

ghə̃	**gɦə̃**	^{H}*gə̃*	Onomatopoeic words represent-
ghĩ	**gɦĩ**	^{H}*gĩ*	ing the type of sounds pro-
ghã	**gɦã**	^{H}*gã*	duced by the spinning-wheel

(i) These words are realized with a velar stop on the formation of which the vocal chords begin to vibrate, and to make this vibration possible some air-pressure is released through the nose.[1] On release of the stop, the velum is lowered and more of the voiced air escapes through the nose than through the mouth, giving a distinct nasal resonance to the whole word. There is an alternative realization in my pronunciation of the words in that the nasal passage is completely closed until the beginning of the following vowel, so that in the aspirated release of the stop there is no trace of nasality.

Palatal ଝଁ- (*jh* ≃)

jhĩ 'the sound of a cricket' **jɦĩ** ^{H}*jĩ*

(i) This word is realized with a stop made by the front of the tongue at a point in the post-alveolar area. The

[1] *See* R. H. Stetson: 'Motor Phonetics', p. 56. *Also see* R. M. S. Heffner: 'General Phonetics', p. 167.

release of the stop is gradual, giving rise to the affrication characteristic of the palatal series. Along with this release the velum is lowered, allowing more air to escape through the nose. The vibration of the vocal chords and the passage of air through the nose continue throughout the utterance.

(ii) For the escape of a good deal of air through nose during the voiced stop, *see* km. tracing No. 28 (jhĩ).

Retroflex ಢ- (*ḍh-*)

ḍhə̃	'sound of a bell'	ḍɦə̃	^{H}*ḍə̃*
ḍhã		ḍɦã	^{H}*ḍã*

(i) These words are realized with a stop formed by the rim of the curled up tongue tip against the hard palate. When the stop is released, a strong stream of voiced breath escapes simultaneously through the mouth and the nose. During the production of the vowel the velum is lowered and more of the voiced air escapes through nose so that the vowel is completely nasalized. Although this is my usual pronunciation of the words, in slow speech, there is a possibility of realization in which the vocal chords do not vibrate as the stop is made, but some time after it.

(iii) The pms. No. 15 (ḍhə̃) and No. 16 (ḍhə) show very similar pictures. The wipe-off of ḍhə̃ is somewhat backer than that of ḍhə (towards the third molar line almost touching it at some point).

Dental ಧ- (*dh-*)

dhã 'run' Imp. dɦã ^{H}*dã*

(i) The word 'dhã' is realized with a dental stop on the release of which a puff of voiced breath passes both through the mouth and the nose. The vocal chords vibrate throughout. The nasal passage is fully open, and most of the air escapes through it adding a distinct nasality to the syllable as a whole.

Labial ଭଁ- (*bh*ଁ)

bhə̃ 'sound produced by wasp' **bɦə̃** ᴴbə̃

(i) This word is realized with an initial bilabial stop. On the release of the stop a puff of voiced breath escapes both through the mouth and the nose. During the formation of the vowel more air passes through the nose and adds distinct nasality to the syllable.

(*h*) *Aspirated syllables with implied dissyllabic alternant having aspirated second syllable with voiced stop*

Phonematic structure CVC

Orthog. e.g. ପଢ୍ (pəḍh)

ଲଭ୍ (labh) (*see* under Method of Treating Aspiration, p. 8)

Oriya monosyllables of this type belong to more than one category of words, e.g. verbs, nouns and adjectives. Among the verbal forms are the imperatives (e.g. pəḍh, meaning 'to read') used in impolite speech. Instances of impolite imperatives with implied aspirated second syllables containing voiceless stops are described on p. 30 and following under A. II(*d*) in Monosyllables. The other categories are nouns (e.g. labh, meaning 'gain') and adjectives (e.g. bodh, meaning 'satisfied') which have alternative realizations with characteristic ə at the end (e.g. labhə, bodhə). Many Oriya words of different grammatical categories have an implied ə at the end but in quick and careless speech they can be realized without it. But here we have taken into account only those forms which have an accepted use without final ə.

Examples of the voiced stops with aspirated release in different series:

Palatal	bujh	(v. Imp.)
Retroflex	pəḍh	(v. Imp.)
Dental	bodh	(adj.)
Labial	labh	(noun)

(We have no examples of the Velar series).

These examples have the following common features in their phonetic realizations:

(1) The vowels are considerably breathified, i.e. voicing and breathiness combine in the production of the vowel, cf. km. No. 36 (bodh) and km. No. 37 (baḍh). Note the high amplitude showing vocalic vibration immediately after the initial stop release suggesting the presence of breathiness.

(2) The breathy release of the final stop is voiceless. *See* mouth and larynx tracing of No. 38 (labh) and No. 37 (baḍh).

(3) There is no appreciable difference in the point of articulation of the final stop of these examples and those of their corresponding forms with the ə glide, e.g. between the final stops in pairs like this:

pəḍh and pəḍhə

(*See* description under A. II(*f*) in Dissyllables, on pp. 72-73).

Detailed description follows in serial order.

Palatal -ঝ (-*jh*)

bujh 'enquire' Imp. **bujh** *bu-ᴴj*(ə)

(i) In the realization of this word the vibration of the vocal chords in forming the vowel is reinforced by extra breathiness. The vocal chords stop vibrating some time before the breathy release of the final stop is complete, thus rendering the last part of the breathy release voiceless.

Retroflex -ঢ় (-*ḍh*)

pəḍh 'read' Imp. **pəṛh** *pə-ᴴḍ*(ə)
baḍh 'serve food' Imp. **baṛh** *ba-ᴴḍ*(ə)

(i) In realizing these words the vibration of the vocal chords during the vowel is reinforced by breathiness.

The tongue tip in the meanwhile is curled back, and the syllable is closed by flapping it forward again with a tap on its way in the alveolar region. The breathiness following the tap is voiceless.

(ii) For the voicelessness of the final breathiness, *see* km. No. 37 (baḍh).

Dental -ಧ್ (-*dh*)

bodh 'satisfied' **bodh** *bo-ᴴd*(ə)

(i) Aspiration in this example is realized as breathy release of a voiced dental stop. In other details it agrees with what is observed in the general remarks under A. II(*h*) in Monosyllables, on pp. 41-42.

Labial -ಭ್ (-*bh*)

labh 'gain' **labβ** *la-ᴴb*(ə)

(i) In this word aspiration is realized as a slow breathy release of the bilabial stop. The breathiness is completely voiceless.

(ii) Km. No. 38 (labh) suggests complete voicelessness of the final aspirated release.

Chapter II

DISSYLLABLES

The method of treatment of aspiration in dissyllables remains basically the same as that followed in monosyllables. Changes, however, have to be made in cases which are peculiar to dissyllables, e.g. in monosyllables, we have words written with final -h (-ହ୍) or a final stop (-ଗ୍, -ଠ, etc.) but we cannot have them in dissyllables, where we have invariably a final vowel. The initial syllable of 'tətsəməs' may be closed, but not if that syllable is aspirated. Since it is found convenient to give an over-all treatment of junction on pp. 138 and following, aspiration in word isolates only is here described under the following categories.

Word Isolates

A. I. *Aspiration without stop*		*Generalized phonological formula*
(*a*) Aspirated initial syllable		
Phonematic structure	V-(C)V	$^{H}V\text{-}(C)V$
Orthog. ହ- (h-)		
(*b*) Aspirated initial syllable		
Phonematic structure	CV-CV (where the first C is a non-nasal continuant)	$^{H}RV\text{-}CV$
Orthog. ହ୍ର- (hr-)		

		Generalized phonological formula
(*c*) Aspirated initial syllable		
Phonematic structure	(1) V-CV	(1) $^{H}\tilde{V}\text{-}CV$
Orthog. ှ̇- (h ≃)		
	(2) CV-CV (where the first C is a nasal consonant)	(2) $^{H}NV\text{-}CV$
Orthog. ှ- (hn-)		
(*d*) Aspirated second syllable		
Phonematic structure	(C)V-V	$(C)V\text{-}^{H}V$
Orthog. -ှ- (-h-)		
(*e*) Aspirated second syllable		
Phonematic structure	(C)V-CV (where the C is a non-nasal continuant or semi-vowel)[1]	$(C)V\text{-}^{H}R/YV$
Orthog. -လှ-, -ရှ-, -ယှ-, (-lh-), (-rh-), (-hy-)		
(*f*) Aspirated second syllable		
Phonematic structure	(1) (*a*) (C)V-V	(1) $(C)V\text{-}^{H}\tilde{V}$
	(*b*) CV-V	$C\tilde{V}\text{-}^{H}V$
Orthog. (*a*) -ှ̇- (-h ≃)		
(*b*) ̇-ှ- (≃ h-)		

[1] In this analysis, the prosodic nature of the semi-vowels y and w has been seen in some examples (*see* A. I(*c*), p. 54, and A. I(*c*) (2) (i), p. 50, in Dissyllables). An over-all phonological analysis of the language might lead one to treat them as belonging to the vowel or prosodic system. But in order to avoid extended phonological discussion beyond that of aspiration, it has been found convenient for our present purpose to treat them as members of the phonematic consonant system, with occasional indications of their phonological implications where relevant.

		Generalized phonological formula
Phonematic structure	(2) CV-CV (where the second C is a nasal consonant)	(2) $CV\text{-}^{H}NV$
Orthog. -ମ୍ହ-, -ହ୍ନ-, (-mh-), (-hn-)		

A. II. *Aspiration with stop*

(*a*) Aspirated initial syllable containing voiceless stop		
Phonematic structure	CV-(C)V	$^{H}PV\text{-}(C)V$
Orthog. ଖ-, ଛ- (kh-), (ch-), etc.		
or *Orthog.* କ୍ଷ- (kṣ-). *See* under detailed description, pp. 60, 61		
(*b*) Aspirated initial syllable containing voiced stop		
Phonematic structure	CV-(C)V	$^{H}BV\text{-}(C)V$
Orthog. ଘ-, ଝ-, (gh-), (jh-), etc.		
(*c*) Aspirated second syllable containing voiceless stop		
Phonematic structure	(C)V-CV	$(C)V\text{-}^{H}PV$
Orthog. -ଖ-, -ଛ-, (-kh-), (-ch-), etc.		
In Skt. 'tətsəmə' words the structure	(C)VC-CV	

		Generalized phonological formula
(*d*) Aspirated second syllable containing voiceless stop + semi-vowel		
Phonematic structure	(C)V-CCV	$(C)V\text{-}^{H}PYV$
Orthog. -ಖ್ಯ-, -ಥ್ಯ- (-khy-), (-ṭhy-)		
(*e*) Aspirated second syllable containing a voiceless stop combined with nasal consonants		
Phonematic structure	CV-CCV (the second C of the aspirated syllable being a nasal consonant)	$CV\text{-}^{H}PNV$
Orthog. -ಕ್ಷ್ಮ-, (-kṣm-)		
(*f*) Aspirated second syllable containing voiced stop		
Phonematic structure	(C)V-CV	$(C)V\text{-}^{H}BV$
Orthog. -ಘ-, -ಝ- (-gh-), (-jh-)		
(*g*) Aspirated second syllable containing voiced stop + non-nasal continuants or semi-vowels		
Phonematic structure	(C)V-CCV	$(C)V\text{-}^{H}BYV$
In Skt. 'tətsəmə' words	(C)VC-CCV	$(C)VC\text{-}^{H}BYA$
Orthog. -ಘ್ರ-, -ಘ್ಯ- (-ghr-), (-ghy-)		

Detailed description of the above categories follows in order, with general remarks when necessary.

General remarks with regard to aspiration in categories (*a*), (*b*) *and* (*c*), *under A. I. Aspiration without stop, on p. 45*

The following common features may be noted:

(i) The breathy onset is voiceless.

(ii) In the vowel aspiration is represented by a breathy reinforcement of the glottal vibration.

(iii) The second syllable whatever its structure, V, CV, or CCV, is not affected by the aspiration in the first syllable.

(*a*) *Aspirated initial syllable—Phonematic structure V*(*C*)*V*

Orthog. ಹ- (h-)

həṭə	'feats'	**həṭə**	*ᴴə-ṭə*
hatə	'hand'	**hatə**	*ᴴa-tə*
hə-u	'yes'	**hə-u**	*ᴴə-u*

(i) Aspiration in these words is realized in the manner as described under A. I(*a*), on p. 17, in Monosyllables. It only remains to be noted that although some breathiness accompanies the glottal vibration of the vowel, both in the case of the monosyllables and of the dissyllables, it is more clearly felt in the monosyllables, both acoustically and kinaesthetically. As an onset to an open vowel (**a**) as in 'hatə' the lack of voice in the aspiration can be very clearly recognized.

(*b*) *Aspirated initial syllable—Phonematic structure CV-CV* (*where the first C is a non-nasal continuant*)

Orthog. ಹ್ರ- (hr-)

hrutə	'stolen'	**hr̥utə**	*ᴴru-tə*
hrudə	'heart'	**hrudə**	*ᴴru-də*

(i) In these examples aspiration is realized as described under A. I(*b*), in Monosyllables, p. 18. The **r** is voiceless or partly voiced according to whether the second

syllable contains voiceless or voiced consonant. The **r** of 'hrutə' is voiceless and that of 'hrudə' is partly voiced towards its end.

(*c*) *Aspirated initial syllable—Phonematic structure (1) V-CV. Orthog.* ହଂ- (*h*≃), *(2) CV-CV (where the first C is a nasal consonant). Orthog.* ହ- (*hn*-)

(1) *Phonematic structure V-CV*

hə̃sə 'swan' **hə̃sə** *H*ə̃-*sə*

(i) Aspiration in this example has a similar realization to that in 'hə' described under A. I(*c*), on p. 19, in Monosyllables.

(2) *Phonematic structure CV-CV* (where the first C is a nasal consonant)

hnuti 'stealing' **hʷnuti** *Hnu-ti*

An initial aspirated syllable containing nasal stop is rare among native Oriya words. The example quoted above is a derived 'tətsəmə' word used in connection with grammatical discourses.

(i) In this example, aspiration is realized as an energetic puff of air passing through an open glottis and escaping simultaneously through the mouth and the nose. While the breathiness is continuing, the vocal chords begin to vibrate and the soft palate is lowered, thus adding voice and nasality to the breathiness. The syllable 'hnu' is realized with a labial modification right from the beginning, i.e. there is considerable protrusion of both the lips simultaneous with the formation of **h** (*see* footnote, p. 46).

(*d*) *Aspirated second syllable—Phonematic structure (C)V-V*

Orthog. -ହ- (-h-)

In regard to the nature of aspiration in the second syllable the following points may be noted.

(1) Aspiration in the non-initial syllable is always realized as voiced (**ɦ**) like the sound of h in the English word 'behind' (**bəɦaind**).

(2) Though for phonological purposes aspiration is treated as a prosody of the syllable, its phonetic realization may, of course, be extended beyond the bounds of the syllable, so that an example such as **aɦa** might be graphically represented as $\frac{\text{ɦ}}{\text{aaa}}$.[1]

aha	'exclamation'	**aɦa**	*a-^{H}a*
oho	'exclamation'	**oɦo**	*o-^{H}o*
baha	'marriage'	**baɦa**	*ba-^{H}a*
kehi	'someone'	**keɦi**	*ke-^{H}i*
rəhə	'wait'	**rəɦə**	*rə-^{H}ə*

(i) In these examples aspiration is realized as a breathy reinforcement of the vocalic vibration of the first vowel in the later part of its articulation. The two processes of voicing and aspiration continue till the end of the words, making the voice breathy and the vowels of both syllables breathified. The amount of breathiness in the final vowel is in all cases greater than that present in the first one. With regard to the presence of breathiness in the initial syllable, I find no difference whether the syllable contains only a vowel or begins with a consonant.

(*e*) *Aspirated second syllable—Phonematic structure* (*C*)*V-CV* (*where the C is a non-nasal continuant or semi-vowel*)

Orthog. -ଲ୍ହ-, -ର୍ହ-, -ହ୍ୟ-
(*-lh-*), (*-rh-*), (*-hy-*)

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[1] *See* J. A. Henderson: 'Asia Major', Vol. I, Part II, 1949, p. 187.

It may be noted that the orthographic representation of some of the continuants is of some interest. It is not out of place to make a passing comment on them. In monosyllables, under A. I(*b*), on p. 18, we found only one possible orthographic combination, i.e. h+r (ହ୍ର), but in the dissyllables h can be combined both with r and l, though in reversed order, i.e. h is preceded by r (rh) and l (lh). There is provision in Oriya orthography for representing r with two different signs: in case of precedence it is placed at the head of the following consonant, ର୍ହ (rh), and in the case of following a consonant, at the foot, ହ୍ର (hr).

ərha	'respectable' f.	**ərɦa**	*ə-*^{H}*ra*
bərhə	'feather of the peacock'	**bərɦə**	*bə-*^{H}*rə*

(i) In realizing these words a strong stream of voiced breath begins to flow through the mouth, while the **r** is still in the process of articulation, and it continues up to the end of the words. The **r** and the final vowels are consequently breathified, and the breath in the second syllable rendered voiced.

These are pure Skt. words fossilized in the Oriya language. No colloquial Oriya words contain such combination of sounds.

(ii) Note the presence of breathiness in **r** and the final vowel in km. No. 20 (ərha).

(iii) The pm. No. 20 (ərha) and pm. No. 19 (əra) show similar pictures with narrow bands of wipe-off from the base along the sides projecting like two horns into the centre of the palate mainly in the pre-palatal zone with slight extension into the post-alveolar zone. In the case of 'ərha' the horn-like bands are a little wider than those in 'əra'.

olha	'get down' Imp.	**olɦa**	*o-*^{H}*la*
gelha	'affectionate'	**gelɦa**	*ge-*^{H}*la*

(i) In these examples **l** is formed with an occlusion made by the tongue tip in the post-alveolar region. It is formed along the median line of the roof of the mouth in such a way as not completely to stop the flow of the breath stream, but to force it to escape over the lateral margin of the tongue on the right side. During the formation of **l** the vibration of the vocal chords is reinforced by a strong current of air ceasing some time before the vocal chords have stopped vibrating for the final vowel. The articulation of 'olha' is more energetic than that of 'ola'.

Whereas the aspirated **r** (orthographically rh) belongs more to Skt. words, the aspirated **l** (*orthog.* lh) occurs in very common native words and presents no difficulty of pronunciation. The uneducated people often realize rh as a sequence of **r** + anaptyctic vowel + voiced **ɦ**, while the need for inserting an anaptyctic vowel in the case of lh is never felt. There is rather a tendency in some people's speech to aspirate **l** where there is no mark of aspiration in the orthography, e.g. 'məla' (dead) as '**məlɦa**' and 'ola' (fool) as '**olɦa**'.

(ii) In km. No. 21 (olha), very high amplitude immediately preceding the section suggesting strong breath corresponding to **ɦ**, indicates that the lateral **l** has been strongly breathified.

(iii) The pm. No. 22 (olha) and pm. No. 21 (ola) are very similar. The band of wipe-off across the centre of the palate lies in the pre-palatal-post-alveolar zone. The wipe-off in 'olha' is slightly wider than that in 'ola'.

-ହ୍ୟ- (-*hy*-)

In Oriya there are two semi-vowels, **y** and **w**, symbolized by ୟ (y) and ୱ (w) respectively. When y (ୟ) combines orthographically with -h- (-ହ-) in the second syllable, it is always placed after -h- (-ହ୍ୟ-, -hy), never before. In combination with consonants, y (ୟ) is placed by the side of the consonant as ୍ୟ.

bahye 'pertaining to outside' **baʸɦyə** *ba-ᴴyə*
səhyə 'that which can be tolerated' **səʸɦyə** *sə-ᴴyə*

(i) In pronouncing these words, while the vowel of the initial syllable is still in the process of articulation, the front of the tongue is suddenly arched up towards the hard palate. A puff of voiced breath escapes through the mouth, and the tongue glides away immediately from that high position in the direction of a low one, and remains in position for the final vowel. The glide is clearly recognizable. In fact the process of palatalization runs not only through **ɦ**, but up to the first vowel, giving it a '**y**' glide.

In some people's speech this small vowel glide develops into a fully-fledged front close vowel **i**, with the result that the vowel of the initial syllable is realized as a diphthong. Such diphthongal realization seems to be due to lax articulation of the combination h+y. In that case 'bahye' and 'səhyə' can be transcribed as **baiɦyə** and **səiɦyə** respectively.

Compare 'səhyə' (**səʸɦyə**) with 'sədyə' (**sədyə**) where the prosody of palatalization is closed by a phonematic unit, d, while in **səʸɦyə** it is carried through **ɦ**, thus strongly suggesting the non-phonematic character of the **ɦ**. (*See* p. xii, footnote, on p. 46).

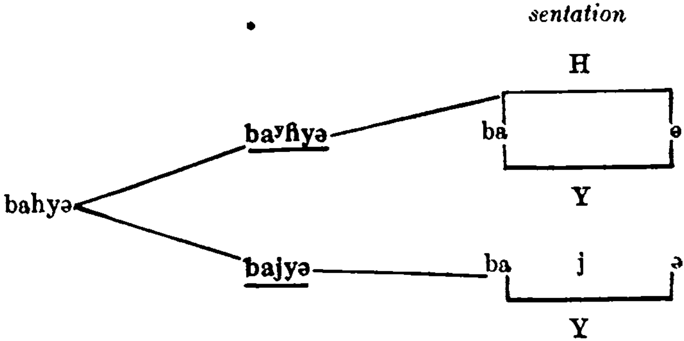
There is still another very common alternative realization in which the combination of aspiration with semi-vowel (**y**) is pronounced as a voiced palatal affricate articulated at a point slightly more advanced than Oriya ଜ (**j**). In terms of this type of pronunciation, those words can be transcribed as **bajyə** and **səjyə**. This alternative pronunciation of the sequence h+y[1] has also been

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[1] *See* Siddheshwar Varma: 'Critical Studies in the Phonetic Observation of the Indian Grammarians'. Chap. VI, p. 126.

recognized in earlier Sanskrit treatises. A graphic representation of the two types of pronunciation of the word 'bahyə', taking into account the prosodic nature of palatalization, might be stated as follows:

Orthog. *Phonetic realization* *Combined prosodic and phonematic representation*



It may be noted that in the second type of pronunciation the H and Y prosodies of the first type are partly replaced by a consonant unit: Y is partly represented by the phonematic j and the H of the first is represented by

(*a*) a stop consonant, and
(*b*) fronted articulation.

(ii) In the two types of realization **baʸɦyə** and **bajyə** the palate shows two entirely different pictures. In pm. No. 23 (bahyə) there is narrow length-wise wipe-off along both sides of the palate extending from the base to a point beyond the first molar line. But in pm. No. 24 (bajyə) there is wipe-off along the sides, together with a complete wipe-off in the centre of the palate, mostly in the post-alveolar zone. The first indicates only the side contact of the tongue, while the second indicates both the front as well as the side contact.

(*f*) *Aspirated second syllable—Phonematic structure*

(1) (*a*) (*C*)*V*-*V* (*b*) *CV*-*V*

Orthog. (*a*) -ಹ- (-*h*≃) (*b*) ಂಹ- (≃*h*-)

(2) *CV*-*CV* (*where the second C is a nasal consonant*)

Orthog. -ಹ್ಮ-, -ಹ್ನ-

(-*mh*-), (-*hn*-)

For an adequate account of aspiration in combination with nasal vowel, it needs to be considered in two different structures, as (*a*) CV-Ṽ, where the aspirated syllable itself contains nasal vowel, and (*b*) CṼ-V, where the aspirated second syllable is in immediate contact with a nasal vowel of the preceding syllable.

(1) (*a*)	ahã	'word of caution'	**ãɦã**	*a*-^{H}*ã*
	kahĩ	'where'	**kãɦĩ**	*ka*-^{H}*ĩ*

(i) In these words aspiration has a realization similar to that in 'aha' described under A. I(*d*), in Dissyllables, on p. 51. The only outstanding difference to be noted is that the soft palate is lowered from the beginning, and nasality increases gradually towards the end of the utterance. A strong stream of voiced breath passes through the nose throughout, adding nasal resonance to the whole word. Here is an instance where the three processes of voicing, aspiration and nasalization overlap.

(1) (*b*)	sĩhə	'lion'	**sĩɦə̃**	*sĩ*-^{H}*ə*

(i) In pronouncing this word, while the vocal chords are vibrating for the production of the first vowel, the velum is lowered, allowing more of the voiced breath to pass through the nose. The breath stream is reinforced, and continues till the end of the utterance. As the velum gradually rises up, the air stream through the nose

diminishes, but continues even after the end of the word with a nasal resonance dying out into the silence.

If the aspirated second syllable contains a stop as in '**sĩgɦə**' ('horn') the final vowel ə is not affected by nasality as in the case of '**sĩɦə̃**'.

It may be noted that while the prosody of nasalization is closed by a phonematic unit (by g in '**sĩgɦə**'), it continues as an accompaniment of aspiration, which fact lends support to our treatment of aspiration as a prosody (*see* p. xvi).

(2) gəmha 'the name of a full moon day' **gəmɦã** *gə-*[H]*ma*

(i) In the pronunciation of this word strong breath is built up during the articulation of the bilabial nasal **m**. On release of the oral stop of **m** a good deal of breath escapes through the mouth, though some air still passes through the nasal cavity. The vowel of the first syllable has an alternative realization, in which it is clearly nasalized. The phonetic implication of the word might then be transcribed as **gə̃mɦã**.

(ii) The mouth and nose tracings in km. No. 29 ('gəmha') suggest nasality running throughout the utterance.

bəhni 'fire' **bənɦĩ** *bə-*[H]*ni*

(iii) In the pronunciation of this word some pressure is released through the nose, even during the articulation of the first vowel. The velum is actually lowered during the articulation of **n**. On release of the apical stop a puff of air escapes both through the mouth and the nose, and dies away some time before the vocal chords have ceased to vibrate.

(iv) In km. No. 30 the nose and mouth tracings suggest nasality running throughout the utterance. Cf. No. 29 (gəmha) and No. 30 (bəhni) and note that nasality during the articulation of the velar stop is greater than that during the labial stop.

(v) The pm. No. 26 (bəhni) and pm. No. 25 (bəni) show similar pictures for the articulation of the two words. The central band of wipe-off in 'bəhni' is wider than that in 'bəni' (blood). The wipe-off in the pre-palatal area is slightly wider in 'bəhni' than in 'bəni'. The apical articulation is shown to be mainly in the post-alveolar zone.

Here is added a note on the confusion arising out of the orthographic representation of h+n (ɳ̤) combination. The need for such a comment will be appreciated when we take into account the phonetic misconceptions into which the Oriya philologists are betrayed by the mere appearance of orthography.[1]

An Oriya philologist[2] following the tradition of ancient grammarians[3] insists on the fact that in sequence written as 'bəhni', **ɦ** always precedes **n** in the pronunciation of that word, and when there is a change in the order (i.e.

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[1] *See* Jespersen: 'Language', p. 23.

See also Henry Sweet: 'Preface to Handbook of Phonetics'. He observes that even a philologist of Schleicher's standing succumbed to the influence of eye philology in preference to ear philology.

[2] *See* G. N. Nandasarma: 'Oḍiya Bhaṣatattwa', pp. 9–18.

He quotes Skt. rules governing the state of affairs in Oriya phonetics '**हकारं पंचभियुक्तं अन्तस्थाभिश्च संयुतं औरस्यं तं विजानीयात्** . . .' (aspiration without stop in combination with ŋ, ɲ, ɳ, n, m and j, r, ḷ, w is born from the breast). Our phonetic analysis has nothing to show of what he observes. It is important to note that Skt. grammar still controls the mode of grammatical thinking in modern Indian languages no less than the Latin grammar controls the grammars of Europe.

[3] Cf. Jespersen: 'Philosophy of Grammar', p. 47.

'This confusion of logic and Latin grammar with its consequence, a Procrustean method of dealing with all languages has been the most fruitful source of mistakes in the province of grammar.'

ñn) it is due perhaps to metathesis.[1] But the km. tracings suggest nothing of metathesis, but an overlapping of nasality and aspiration, and there is nothing like nasality preceding or following aspiration in a serial sense. As a matter of fact, there will be a variety of 'timings' for the medial apical contact, and perhaps the exact point need not, and indeed cannot, be shown in spelling. There should be no rigidity about the precedence of h or n in the group, as both hn and nh are equally justified on phonetic grounds. Words written with h+n combination abound in the language.

Some examples:	kəhnei	'name of a person'
	pəhna	'udder'
	jəhnə	'moon'
	jahnəbi	'the Ganges'
	kahnu	'the name of a person'

General Remarks on Aspirated Initial Syllables containing Voiceless Stop

Phonematic structure CV-(C)V

(1) Except in a few reduplicative[2] words such as 'ghogho' (noise of a market-place), 'bhobho' (the bark of a dog) and 'dhədhə' ('catch', emphatic imp.), two aspirated syllables containing stops can never occur in any other category of dissyllabic Oriya words, i.e. when one syllable is aspirated, the other must be unaspirated, e.g. 'khoka'.

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[1] *See* S. K. Chatterjee: 'Origin and Development of Bengali', p. 440. *See also* Dr. W. S. Allen: Some prosodic aspects of aspiration and retroflexion in Sanskrit. *B.S.O.A.S.*, Vol. XIII, Part 4. He is sceptical of the conception of assimilation, dissimilation and metathesis, and observes: 'They are not only unnecessary but also involve us in sort of statements which no science can tolerate . . . Many examples of so-called metathesis are also probably best reduced to prosodic statements.'

[2] *See* Henry Sweet: 'New English Grammar', Part I, p. 3.

It may be noted here that the phonological structure of the two categories of reduplicative and non-reduplicative words is very different: in non-reduplicative words aspiration is centred on one of any two successive syllables ('khatə' or 'rəkhə'), whereas in reduplicative words the aspiration spreads equally over both (e.g. 'khokho'). This suggests that for phonological purposes such words might be treated as compounds of two monosyllables. Since we see that the reduplicatives constitute a special class of words, both phonetically and phonologically, it is convenient to treat them in one place under 'Reduplicatives' rather than sprinkle them here and there under the description of each series, velar, palatal, etc.

(2) In the initial aspirated syllable the voiceless stop never combines with non-nasal or nasal continuants. But in the case of the velars the combination of voiceless stop with the semi-vowel y is possible, e.g. 'khyatə' (known). It is to be noted that the realization of this group is identical with that represented by the orthographic symbol କ୍ଷ (kṣ) and the latter is accordingly treated under the same category. There is in fact a tendency to supplant କ୍ଷ- (kṣ-) by ଖ୍ୟ- (khy-) (*see* p. 47).

(3) Where an initial aspirated syllable containing a voiced stop is followed by a nasal stop in the second syllable, there is a distinctive nasalization of the initial aspirated syllable (**gɦə̃nə̃**).

Detailed description of the different series follows.

(*a*) *Aspirated initial syllables containing voiceless stop*

Phonematic structure CV-(C)V

Orthog. ଖ-, ଛ-,
(kh-), (ch-), etc.

or *Orthog.* କ୍ଷ (kṣ-)

Velar ಖ- (kh-)

khoka	'proper name'	**k^{x}hoka**	^{H}*ko-ka*
khua	'arm'	**k^{x}hua**	^{H}*ku-a*
khoḷə	'a musical instrument'	**k^{x}hoḷə**	^{H}*ko-ḷə*

(*See* description under A. II(*a*), in Monosyllables, on p. 24).

Aspirated syllables containing voiceless velar stop combined with semi-vowel y. Orthog. ಖ್ಯ- (khy-)/ಕ್ಷ- (kṣ-)

(*See* note on initial combination of velar stop combined with y, on p. 60).

kṣəma	'pardon' n.	**ķ[1]ç^{h}əmã**	^{H}*k^{y}ə-ma*

(i) In this word aspiration is realized as a breathy release to a stop made by the back of the tongue further forward than in the case of **k^{x}h** in other context, viz. at a point beyond the joining of the hard and the soft palate. The tongue slowly moves away from the point of contact, giving rise to a very strong friction with palatal modification. In some people's speech the tongue contact is so very forward that it is realized as a palatal affricate—a fact registered by writing it with an entirely different symbol ಛ (ch). The final vowel is nasalized.

The symbol ಕ್ಷ by which the sequence **ķç^h** may be represented is, in certain conditions, derived like the sound itself, from Skt. क्ष; this symbol is generally transliterated by **kṣ**, but according to some of the ancient phoneticians, the realization was not as **kṣ** but as **kç** or **khy**.[2] The single symbolization ಕ್ಷ appropriately recognizes the phonetic unity of the sound with palatalization running throughout (*see* p. 47).

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[1] For the palatal stop we use ķ not C in the phonetic transcription, the latter being found economical for the frequent palatals which would otherwise have to be written ʧ.

[2] *See* Dr. W. S. Allen: Some prosodic aspects of retroflexion and aspiration in Sanskrit. *B.S.O.A.S.*, Vol. XIII, Part 4 (now under print).

(ii) The pms. No. 27 (khəma) and No. 28 (kʂəma) also support the palatal nature of kʂ. In the case of (khəma) there are very small pieces of wipe-off at the two ends of the base line of the palate. But in pm. No. 28 (kʂəma) there is a complete wipe-off in the palatal area extending along the sides right up to the first molar line. It suggests that the back of the tongue is in contact with the hard palate while the sides of the tongue are pressed against the palate lengthwise.

Palatal ಛ- (*ch-*)

chə-u	'a kind of dance'	**chəu**	*ᴴcə-u*
chaṭə	'small stick'	**chaṭə**	*ᴴca-ṭə*
chalə	'hide' n.	**chalə**	*ᴴca-lə*

(i) For the realization of aspiration as a breathy release to a palatal stop in these examples, *see* description under A. II(*a*), in Monosyllables, on p. 25.

Retroflex ಠ- (*ṭh-*)

ṭhəkə	'cheat'	**ṭhəkə**	*ᴴṭə-kə*
ṭhabə	'place' n.	**ṭhabə**	*ᴴṭa-bə*
ṭhuḷə	'collected' adj.	**ṭhuḷə**	*ᴴṭu-ḷə*

(i) For the description of aspiration as a breathy release to a retroflex stop in these examples, *see* under A. II(*a*), in Monosyllables, on pp. 25-26.

Dental ಥ- (*th-*)

thakə	'layer'	**thakə**	*ᴴta-kə*
thanə	'place' n.	**thanə**	*ᴴta-nə*
thaḷə	'plate'	**thaḷə**	*ᴴta-ḷə*

(i) For description of aspiration as a breathy release to a dental stop, *see* under A. II(*a*), in Monosyllables, on p. 26.

Labial ଫ- (*ph-*)

phaṭə	'hole'	**phaṭə**	^{H}*pa-ṭə*
phaḷə	'piece' n.	**phaḷə**	^{H}*pa-ḷə*

Here aspiration is realized as a breathy release to a bilabial stop. *See* description under A. II(*a*), in Monosyllables, on p. 27.

(*b*) *Aspirated initial syllable containing voiced stop*

Phonematic structure CV-(C)V

Orthog. ଘ-, ଝ-,
(gh-), (jh-), etc.

For all the aspirated syllables containing voiced stops described under this category we have to assume that some pressure is released through the nasal cavity during the formation of the voiced stop (*see* H. R. Stetson : 'Motor Phonetics', p. 56).

Velar ଘ- (*gh-*)

gha-i	'water passage'	**gɦai**	^{H}*ga-i*
ghərə	'house'	**gɦərə**	^{H}*gə-rə*

(i) Aspiration is here realized as a breathy release to a velar stop. It has a realization similar to that described under A. II(*c*), in Monosyllables, on p. 34. When the second syllable contains a nasal consonant, it has been found that some degree of pressure is allowed through the nose preceding all the voiced stops,[1] and not only during the stop. The pressure through the nose, however, is very much greater in words such as are described below, where the second syllable contains a nasal.

ghənə	'proper name'	**gɦə̃nə̃**	^{H}*gɔ-nɔ*
ghəmə	'a kind of jar'	**gɦə̃mə̃**	^{H}*gɔ-mɔ*
ghəɳa	'oil-pressing machine'	**gɦə̃ɳã**	^{H}*gɔ-ɳa*

[1] The escape of air through the nose is a phonetic feature though the greater degree of it has a phonological significance, as it may help to mark the prosody of aspiration.

(i) In the formation of these words, after the articulation of the first syllable (*see* description under A. II(*e*), on p. 34) the strong breath stream is obstructed by the articulators at the appropriate point (a dental stop for **n** and retroflex stop for **ɳ**), and on release of the stop it escapes both through the mouth and the nose. Both the vowels are nasalized, the first is much less than the second.

(ii) The km. No. 31 (ghəna) suggests the escape of air through the nose during the initial stop.

It may be noted that of the three examples given below with nasal consonants of different categories in the second syllable, viz.

gɦə̃mə̃
gɦə̃nə̃
gɦə̃ɳã,

the nasalization in my pronunciation of the initial syllable is more perceptible when the second syllable contains a retroflex nasal consonant **ɳ** rather than any other. In quick and careless speech the **gɦ** of '**gɦə̃nə̃**' may be reduced to a voiced **ɦ**, but it does not so happen when the second syllable contains a retroflex **ɳ**. Thus it may be noted that in '**gɦə̃nə̃**' the aspiration feature of the first syllable is dominant, not the occlusion of the consonant. It supports the tendency for prosodies to persist even when the phonematic units undergo change or loss (*see* p. 67).

Palatal झ- (*jh-*)

jhi-ə	'daughter'	**jɦiə**	*^{H}ji-ə*
jhaɭə	'sweat'	**jɦaɭə**	*^{H}ja-ɭə*

Aspiration in the initial syllable is realized in a manner closely similar to that described under A. II(*e*), in Monosyllables, on p. 34.

jhuɳa 'powder obtained from wood' **jɦũɳã** *^{H}ju-ɳa*

The only difference between this example and one without nasality in the second syllable (as in 'jhi-ə') is that

more breath passes through the nose during the formation of the initial stop in the former case than in the latter.

Retroflex ଢ- (*ḍh*-)

ḍhokə	'morsel'	**ḍɦokə**	*ᴴḍo-kə*
ḍhegə	'popular idiom'	**ḍɦegə**	*ᴴḍe-gə*

Aspiration in these examples has a realization similar to that described under A. II(*e*), in Monosyllables, on p. 35.

Dental ଧ- (*dh*-)

dhu-a	'washed' adj.	**dɦua**	*ᴴdu-a*
dhəḷə	'a family name'	**dɦəḷə**	*ᴴdə-ḷə*

Aspiration in the initial syllable of these words is realized in a manner similar to that described under A. II(*e*), in Monosyllables, on p. 35.

Labial ଭ- (*bh*-)

bhokə	'hunger'	**bɦokə**	*ᴴbo-kə*
bhogə	'pleasure'	**bɦogə**	*ᴴbo-gə*
bhoḷə	'hole'	**bɦoḷə**	*ᴴbo-ḷə*

For the realization of aspiration in these words, *see* description under A. II(*e*), in Monosyllables, on p. 35.

bhəṇe 'speaks' **bɦə̃ṇẽ** *ᴴbə-ṇe*

The realization of aspiration of the initial syllable is similar to that described under A. II(*e*), in Monosyllables, on pp. 35-36. The only difference is that the nasal pressure during the formation of the initial stop in this case is more evident than in the case where the second syllable contains no nasality.

REDUPLICATIVES

For convenience of treatment we will describe first the examples with (1) voiceless stops in their serial order, and then (2) those with voiced stops.

General Remarks on Reduplicatives

For some characteristic features of reduplicatives, *see* under 'General remarks on aspirated initial syllables containing voiceless stop—(1)', on p. 59, in Dissyllables. It may be noted that in reduplicatives containing two voiceless stops, the amount of breathiness is almost the same, or little more in the first. In the case of voiced ones, the breathiness in the first syllable is decidedly greater than that in the second.

(1) *Reduplicatives with voiceless stops*

Velar ಖ- (*kh*-)

khokho 'noise of a market-place' **kˣhokˣho** *ᴴko-ᴴko*

(i) In this example aspiration is realized as a breathy release to a velar stop in both the aspirated syllables. The realization of each syllable is similar to that described under A. II(*a*), in Monosyllables, on p. 24. The vibration of the vocal chords is reinforced by a good deal of breath making both the vowels strongly breathified. The amount of breath present in the release of both the stops is almost the same.

Retroflex ಠ- (*ṭh*-)

ṭhoṭha 'sound of clapping' **ṭhoṭha** *ᴴṭo-ᴴṭa*

(i) In this example aspiration is realized as a breathy release to a retroflex stop in both the aspirated syllables. The realization of each syllable is similar to that described under A. II(*a*), in Monosyllables, on p. 25. The two vowels are breathified, as those in the case of 'khokho' described above under the Velar series. For the rest, *see* 'General Remarks on Reduplicatives', above.

Dental ಥ- (*th*-)

thuthu 'spitting' **thuthu** *ᴴtu-ᴴtu*

(i) Aspiration is here realized as a breathy release to a dental stop, *see* description under A. II(*a*), in Monosyllables,

on p. 26. For the rest, *see* 'General Remarks on Reduplicatives', on p. 66.

Labials

phopha 'the manner of speaking quickly' **phopha** ^{H}po-^{H}pa

(i) Aspiration is realized as a breathy release to a bilabial stop in both the syllables. For the rest, *see* 'General Remarks on Reduplicatives', on p. 66. In quick speech the consonant has the possibility of being realized as bilabial fricative ϕ.

This is another example of the tendency mentioned above under 'ghənə' (A. II(*b*), Velar, in Dissyllables, on p. 64); the aspiration prosody extends throughout the word, being implied even in the stop; in the realization with fricative ϕ the implied aspiration becomes dominant.

(ii) Note the abrupt throw-up above the line in km. No. 22 (phopha), indicating energetic articulation. The vowel sections appearing partly above the line are consistent with the presence of breathiness in them. The final vowel is devoiced towards the end.

(2) *Reduplicatives with voiced stops*

Velar ଘ- (*gh*-)

ghogho 'noise of market-place' **gɣɦogɣɦo** ^{H}go-^{H}go

(i) This word has a similar realization to its voiceless counterpart (khokho) described under 'Reduplicatives (1) Velar, on p. 66, in Dissyllables'. The only difference is the addition of voice. The amount of breathiness in the release of the first stop is greater than that in the second.

(ii) Km. No. 23 (ghogho). The higher amplitude in the first stop-release section than that in the second suggests greater breathiness in the first.

Retroflex ଢ- (*ḍh*-)

ḍhoḍha 'sound of breaking a bamboo' **ḍɦoḍɦa** $^{H}ḍo$-$^{H}ḍa$

(i) The realization of aspiration in this context is similar to that described under 'Reduplicatives (1), Retroflex series, in Dissyllables', on p. 66. The outstanding difference is the accompaniment of voice in this case.

Dental ಧ- (*dh*-)

dhədhə 'catch !' (emphatic Imp.) **dɦədɦə** *ᴴdə-ᴴdə*

(i) This word is realized with an initial dental stop, on the release of which a strong stream of voiced air passes through the mouth until it is obstructed by another dental stop. On release of the second stop, the stream of air again escapes through the mouth, and the vocal chords continue vibrating some time after the cessation of the breath. The breath force in the release of the second stop is less vigorous than it is after the release of the first.

It may be noted that this word containing two aspirated syllables is not an anomatopoeic word like those found in the velar (khokho), retroflex (ṭhoṭha) or labial series. This is the intensive imperative verbal form of 'dhə' ('catch' v. Imp.). It is perhaps due to the fact that the first syllable is stressed that there is more breathiness in the realization. The kinaesthetic feeling is that the tongue contact in the first syllable is very firm, and in the second lax, so that sometimes the later results in a fricative **ðɦ**.

Labial ಭ- (*bh*-)

bhobho 'the bark of a dog' **bɦobɦo** *ᴴbo-ᴴbo*
bɦoβɦo

(i) Aspiration in this word is realized as in the word having two aspirated syllables containing voiceless stops (phopha) described under 'Reduplicatives (1) Labial series, in Dissyllables', on p. 95, with the only difference of voice being present in this case. The articulation of the second stop is lax compared with the first, and tends towards friction under dominant aspiration, phonetically transcribed as **β**.

(c) *Aspirated second syllable containing voiceless stop*

Phonematic structure (*C*)*V*-*CV*

Orthog. -ಖ-, -ಛ-

(-kh-), (-ch-), etc.

On examining examples with aspirated second syllables containing stops of various series (velar, palatal, etc.) in different contexts (with front and back vowels), it has been found that they do not provide any special interest apart from what has already been stated in the initial position in the Dissyllables (*see* under A. II(*a*), in Dissyllables, on pp. 60-61 and following). The main difference between the initial and medial syllables, as is obvious, lies in the fact that the stop in the second syllable is preceded by a vowel glide,[1] which the stop in the initial syllable has not. But that does not seem to bring in any very significant acoustic or articulatory difference. Here an attempt has been made to describe in detail the few examples provided by the velar and labial series (described below) which show some particular points of interest.

Velar -ಖ- (*-kh-*)

əkha	'sack' n.	**ək^{x}ha**	*ə-^{H}ka*
kakhə	'arm-pit'	**kak^{x}hə**	*ka-^{H}kə*
səkha	'friend'	**sək^{x}ha**	*sə-^{H}ka*

(i) For the description of aspiration in these examples, *see* under A. II(*a*), in Dissyllables, on p. 61. The velar friction in the second syllable is greater than that in the initial syllable. This peculiarity is very clear especially when the initial syllable contains a stop of the same series, i.e. as in 'kakhə'.

akhi	'eye'	**akç^{h}i**	*a-^{H}ki*
nəkhi	'having nails'	**nəkç^{h}i**	*nə-^{H}ki*

[1] *See* R. M. S. Heffner: 'General Phonetics', pp. 165 and following.

(i) In these examples ending in a close front vowel, aspiration is realized as a breathy release to a stop made by the back of the tongue further forward than it is for **k^{x}h** in other contexts **(ək^{x}ha)**. On the slow release of the articulators from the point of contact, a strong palatal friction is heard with extra breathiness. (iii) Compare the pms. No. 29 (i), No. 30 (əkha) and No. 31 (akhi).

In the case of 'i' (pm. No. 29) there is wipe-off along the sides of the palate extending from the base to the alveolar region. In 'əkha' (pm. No. 30) there are very small areas of wipe-off at the two ends of the base line. But for 'akhi' (pm. No. 31) there is wipe-off along the sides, as for 'i', with additional wipe-off at the base, suggesting advanced tongue contact in the palatal area for 'kh' followed by a front vowel. The wipe-off along the sides is narrower than that for 'i'.

Labial -ಫ- (*-ph-*)

gəphi 'garrulous' f. **gəpɸi** *gə-*^{H}*pi*

(i) Aspiration in this example is realized as a fricative release of a bilabial stop.

(*d*) *Aspirated second syllable containing voiceless stop + semi-vowel*

Phonematic structure (*C*)*V-CCV*

Orthog. -ಖ್ಯ-, -ಠ್ಯ-

(-khy-), (-ʈhy-)

A few words belonging to the retroflex series which show some peculiarity are described below.

Retroflex -ಠ- (*-ʈh-*)

paʈhyə	'lesson'	**paʈshyə**	*pa-*^{H}*ʈyə*
saʈhyə	'deceit'	**saʈshyə**	*sa-*^{H}*ʈyə*

(i) In pronouncing these words, the second syllable is realized with a stop made by the retroflexed tongue tip

against the palato-alveolar region. On the release of the stop, the air built behind it passes through a momentary constriction made between the blade of the tongue and the teeth ridge, giving rise to a friction having some similarity with **s**. Comparing these examples with '**paṭhə**' (where not combined with a semi-vowel) it can easily be recognized that a clear-cut retroflex quality associated with **ṭh** of '**paṭhə**' is not to be found in the combinations with the semi-vowel. The above-quoted examples are pure Skt. words taken into the language. Aspirated syllables with retroflex stop combined with semi-vowel do not occur in the native words of the language.

(ii) The pm. No. 33 (paṭhyə) suggests palato-alveolar contact, there being a band of wipe-off extending from a point in the mid-palatal region, between the third and the second molar line, to the post-alveolar region up to the canine line. In the case of pm. No. 32 (paṭhə), the band of wipe-off is slightly narrower and backer (than that of 'paṭhyə'), extending from a point little above the third molar line into the post-alveolar region, to a point between the first molar and canine line. The pm. of 'paṭhyə' suggests firmer contact than that of 'paṭhə'.

(*e*) *Aspirated second syllable containing a voiceless stop combined with nasal consonants*

Phonematic structure CV-CCV (*the second C of the aspirated syllable being a nasal consonant*)

Orthog. -[illegible]- (-kṣm-)

We have no examples of the aspirated second syllables containing voiceless stops combined with nasal vowels. Some examples belonging to the velar series show some interest only when the stop is combined with bilabial nasal **m**. The description follows below.

jɔkṣma	'tuberculosis'	**jək^{x}h^{w}ã**	*jə-^{H}kma*
sukṣmə	'fine'	**suk^{x}h^{w}ə̃**	*su-^{H}kmə*

(i) In these examples the second syllable is realized with a velar stop. Simultaneous with the stop is added a secondary modification at the lips, making them very much rounded. With the release of the stop, the velum is lowered, allowing most of the air to escape through the nose, till the end of the utterance.

It may be noted that the type of pronunciation described above is found in the speech of the educated people only. In the speech of the common people the combination written as kṣm is realized with a bilabial nasal **m**, separated from the preceding stop with a vowel of the same quality as that in the initial syllable. The stop in the aspirated syllable **(kˣhʷ)** in that case loses its bilabial modification. Thus the two examples quoted above can be transcribed as **'jəkˣhəma'** and **'sukˣhumə'**. The phonological formula *-ᴴkm-* has been used with a view to covering both these possibilities of realization mentioned above.

(f) Aspirated second syllable containing a voiced stop

Phonematic structure (C')V-CV

Orthog. -ଘ-, -ଝ-
(-gh-), (-jh-)

We have already seen that except in a very few examples aspirated second syllables containing voiceless stops are of no specific phonetic interest. The same is the case with the aspirated second syllables containing voiced stops. The only exceptions provided by some examples belonging to the retroflex series are described below.

Retroflex -ଢ- (*-ḍh-*)

pəḍhə	'read' Imp.	**pəɽɦə**	*pəᴴḍə*
bəḍhi	'flood'	**bəɽɦi**	*bə-ᴴḍi*

(i) In realizing the aspirated second syllable in these words, the tongue tip is curled back. Then it flaps forward and touches the prepalatal—post-alveolar region in passing, but does not remain there for any appreciable time. 'Instead of being deliberately placed in that position and pulled away, the tongue tip flaps rapidly in one direction and makes contact in passing'. A strong breath stream then flows unobstructed and ceases before the vocal chords have stopped vibrating for the final vowel.

The retroflex flapped[1] articulation is not only a feature of the aspirated syllable, but also of the unaspirated syllable.

(ii) The pm. No. 18 (pəɖhə) suggests a typical flapped articulation. The area brushed by the tongue extends from the prepalatal to the post-alveolar region between the second molar and canine line. The wipe-off in the centre clearly suggests a passing rather than stationary contact. Cf. pm. No. 17 (pəɖh) which shows similar picture. The wipe-off is only slightly narrower than that of (pəɖhə).

This sound ɽ never occurs in the initial syllable. It occurs regularly in the second syllable, and very rarely as a flapped closure to a monosyllable (e.g. **baɽh**). The same symbol ଢ used for 'ɖh-' in the initial syllable represents the flapped 'ɽ' in the second syllable, with the modification of a dot (ଢ଼). But there is considerable divergence in the use or omission of the dot at present. It has ceased to carry any phonological significance. This type of contextual distribution[2] of retroflex sounds in Oriya is in common with that of many other Indian languages.

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[1] *See* K. L. Pike: 'Phonetics', p. 48, where he quotes H. Sweet: 'Flapped consonants are pure glides organically as well as acoustically, there being absolutely no fixed point in their formation.'

[2] *See* J. R. Firth: Phonological features of some Indian languages. Proceedings of the Second International Congress of Phonetic Sciences, London, 1935, p. 178.

(*g*) *Aspirated second syllable containing voiced stop + non-nasal continuants or semi-vowels*

Phonematic structure (*C*)*V*-*CCV*

Orthog. -ಘ್ರ-, -ಘ್ಯ-
(-ghr-), (-ghy-)

In Skt. '*tətsəmə*' *words Phonematic structure* (*C*)*VC*-*CCV*

The voiced stop combined with non-nasal continuant combination being of no additional interest here, we have taken into account only those combinations with semi-vowel which are especially interesting.

Velar -ಘ- (-*gh*-)

ərghyə 'offering' **ərgɦyə** *ər-*[H]*gyə*

(i) In this word the second syllable is realized with a velar closure made by the back of the tongue further forward (than for **gɦ** in other context). The stop is released rather slowly, giving rise to strong velar friction.

(ii) The pm. No. 35 (ərghyə) shows a considerably wide wipe-off along the base with slight break at the median line, suggesting a velar contact further forward. In pm. No. 34 (ərghə) there is no wipe-off along the base line except some contact along the sides of the palate. The broken band of wipe-off suggesting the **r** articulation is wider in (ərghyə) than in (ərghə). The break in the band is smaller in the former than in the latter.

Retroflex -ಢ- (-*ḍh*-)

aḍhyə 'plentitude' **aḍɦyə** *a-*[H]*ḍyə*

The second syllable in this example is formed with a stop made in the prepalatal—post-alveolar region (described under A. II(*b*), Retroflex, in Dissyllables, on p. 65). The stop is released under pressure of a voiced air stream and the tongue glides away from the position of a close front vowel to that of a lower one.

(iii) The pm. No. 36 (aḍhyə) has a wipe-off extending from between the third and the second molar lines up to the canine line, suggestive of typical voiced retroflex stop articulation. There is narrow wipe-off along both sides up to the base.

Chapter III

TRISYLLABLES

Trisyllables have been divided under two heads, under the broad heading: A. Word Isolates:

A. I. Aspiration without stop.

A. II. Aspiration with stop.

The following few remarks apply to category A. I. Aspiration without stop. A. II will be discussed in its proper place.

The method of treatment adopted for the description of aspiration without stop in trisyllables is in principle the same as that followed in monosyllables and dissyllables. On examination, it has been found that what matters most in trisyllables is the position of the aspirated syllable (first, second or third) in the word, combined with the nature of the sounds contained in other syllables. In the two words 'məsiha' and 'kəḷiha', aspiration even in the same (third) syllable is differently realized (*see* description below, on p. 82). Owing to the difference in the nature of the sounds contained in the second syllable (i.e. a fricative (**s**) in one case, and a lateral (**ḷ**) in the other). It has been found convenient to place our examples under categories based on the position of the aspirated syllable in the word. In the following chapter, we have described only those instances which provide additional interest to what has already been found in monosyllables and in dissyllables. In trisyllables aspiration without stop (i) in the initial syllable, (ii) in syllables containing non-nasal

continuants and semi-vowels, and (iii) in syllables containing nasals, provided no special features of interest, and therefore no additional description of them has been given.

We have already seen under dissyllables that two aspirated syllables cannot occur in one and the same word (excepting a few reduplicatives). The same rule, with exceptions limited to a few categories of words, applies to trisyllables also.

The exceptions are :

(i) A few emphatic deictics.

e.g. 'ehahī' ('this' emphatic). (*See* under A. I(*d*), in Trisyllables, on p. 83).

(ii) Exclamations.

e.g. 'ahaha' (expression of ridicule). (*See* under A. I(*d*), in Trisyllables, on p. 82).

(iii) A rare proper name containing aspirated syllables with and without stop in the one word, viz. 'bhaməhə'.

(*See* under A. I(*c*), on p. 82, in Trisyllables).

(iv) Verbal forms.

(*a*) third person singular indicative,

(*b*) past perfect.

e.g. (*a*) 'khauchi' (is eating),

(*b*) 'pəḍhichi' (has read).

(*See* under A. II(*b*), Palatals, in Trisyllables, on p. 87).

In dissyllables, aspiration without stop in non-initial syllables is invariably realized as voiced breath, but in trisyllables it is almost always realized alternatively as voiced or voiceless breath, e.g. 'kəhə' is pronounced as **kəɦə**, but 'kəhəra' as **kəɦəra** and **kəhəra**. I have not been able to ascertain the conditions which govern the voicing. It may be due to a combination of high speed and pitch. Where in a trisyllabic word, the final syllable is represented in writing as containing aspiration (-h-), the aspiration

may be realized as a slight breathiness of the final vowel, e.g. 'birəhə' may be pronounced as '**birəə**^{h}' ('separation').

A. I. Aspiration without stop in trisyllables is described under the following categories:[1]

Generalized phonological formula

(*a*) Aspirated second syllable without stop.

Phonematic structure (C)V-V-CV $(C)V\text{-}^{H}V\text{-}CV$

Orthog. -ಹ- (-h-)

(*b*) Aspirated third syllable without stop; non-nasal continuant in the second syllable.

Phonematic structure (C)V-CV-V $(C)V\text{-}RV\text{-}^{H}V$

Orthog. -ಹ- (-h-)

(*c*) Aspirated third syllable without stop; aspirated initial syllable containing stop.

Phonematic structure CV-CV-V $^{H}CV\text{-}CV\text{-}^{H}V$

Orthog. 1st syllable -ಭ- (bh-),

3rd syllable -ಹ- (-h-)

(*d*) Two successive (2nd and 3rd) aspirated syllables without stop.

Phonematic structure (C)V-V-V $(C)V\text{-}^{H}V\text{-}^{H}V$

Orthog. -ಹ- (-h-)

Detailed description follows in order.

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[1] In the following chapters, no statement about the specific nature of the consonants in different syllables in the phonological formula is included, excepting in those syllables which we have mentioned in the descriptive labels of the various categories.

(*a*) *Aspirated second syllable without stop*

Phonematic structure (C)V-V-CV

Under this class are contained two types of sequences of considerable interest.

(1) When the initial syllable contains a monophthong **ə**, but is orthographically represented as a diphthong əi.

(2) When the initial syllable contains a fricative.

(1)	əihikə	'Here, below'	**əɦikə**	*əi-^{H}i-kə*
	dəihikə	'bodily'	**dəɦikə**	*dəi-^{H}i-kə*

In realizing these examples, some breathiness, however slight, is built up during the production of the first vowel **ə**, and then after reaching the maximum amplitude, it continues into the second vowel, and makes it partly breathified. (*See* under Dissyllables, General remarks, A. I(ii), on p. 49). The voice is breathy. But there is an alternative realization, in which the vocal chords stop vibrating for a while as the breath passes through the mouth, thus making the breath partly voiceless (**h**).

It may be noted that in Oriya speech, an aspirated second syllable without stop is never preceded by a diphthong **əi**. But in the orthography, the symbol ୈ (əi) representing **əi** is still maintained as is usually done before a syllable containing any other stop; cf.

dəihikə	**dəɦikə**
dəibikə	**dəibikə**

(2)	səhərə	'city'	**səɦərə**	*sə-^{H}ə-rə*
	səhayə	'help'	**səɦayə**	*sə-^{H}a-yə*
	sahebə	'Englishman'	**saɦeβə**	*sa-^{H}e-bə*

(i) In these words, the s is realized as a post-dental fricative (**s**) with much greater friction than when it is followed by a syllable containing a stop as in '**səbərə**'. In the above examples, where a stop consonant occurs in the third syllable, it has a tendency to have a fricative.

realization, and the articulation involved in making the stop is very lax, e.g.

saheb **saɦeβə**
sohag **soɦaʎə**

In quick speech these stops are realized without the characteristic final ə glide.

(*b*) *Aspirated third syllable without stop; non-nasal continuant in the second syllable*

Phonematic structure (*C*)*V-CV-V*

In nearly all examples where the aspirated third syllable contains no stop, the second syllable contains a continuant, which may be nasal or non-nasal. Since the nasal is found to be of no special interest, only examples with non-nasal continuants are described below:

kəriha	'small cloth'	**kərʱia** *or* **kərıɦa**	*kə-ri-ʱa*
kəḷiha	'quarrelsome'	**kəḷʱia** *or* **kəḷıɦa**	*kə-ḷi-ʱa*

(i) In realizing these examples, an extra stream of air begins to flow through the mouth while the continuants in the second syllables, i.e. **r** and **ḷ** are still in the process of articulation. Most of the breath being spent out by the time the articulation of the second syllable is complete, only a weak stream of air continues till the end of the utterance. Consequently the final syllable is realized without any breathiness. But there is an alternative realization in which the third syllable can be realized with breathiness.

Cf. two examples (*a*) kəḷiha, **kəḷʱia**
(*b*) məsiha, **məsıɦa**

(where the second syllable contains a sound other than **r** or **ḷ**) and note that while 'kəḷiha' can be realized both as

kəḷⁿia and **kəḷiɦa**, 'məsiha' (year) cannot be realized both as **məsⁿia** and **məsiɦa** (*see* General Remarks, under A. I, on p. 77, Trisyllables) but only as **məsiɦa**.

In trisyllables, wherever the aspiration in the third syllable is realized and transcribed as **-ɦ-**, it has also an alternative realization as **-h-**.

(*c*) *Aspirated third syllable without stop; aspirated initial syllable containing stop*

Phonematic structure CV-CV-V

The simultaneous existence of two aspirated syllables, one without stop occurring finally, and the other with stop occurring initially (as in 'bhaməhə'), is foreign to the Oriya word structure (*see* under General Remarks, under A. I. Exception (iii), in Trisyllables, on p. 78). This word is the name of an ancient Skt. rhetorician known only to the educated people.

bhaməhə 'proper name' **bhaməhə̥** *ᴴba-mə-ᴴə*

(i) This word is realized with a labial stop, on the release of which a strong stream of voiced breath begins to flow through the mouth until checked by a stop at the lip for **m**. Soon after, a less strong stream of breath is initiated, and continues till the end of the utterance. The vibration of the vocal chords toward the end of the utterance is very weak. Less breathiness in the third syllable correlates with the presence of strong breath in the initial syllable. This fact is underlined by an example such as '**bəraɦə**' where greater breath stress in the third syllable correlates with the lack of breathiness in the initial.

(*d*) *Two successive (second and third) aspirated syllables without stop*

Phonematic structure (C)V-V-V

ahaha 'an expression of ridicule' **aɦaha** *a-ᴴa-ᴴa*

or

aɦaɦa

(i) In pronouncing this word extra breath is built up before the articulation of the first vowel is complete. The aspiration in the second syllable has a realization similar to that described under A. I(*d*), on p. 51, in Dissyllables. During the formation of the final syllable written as ha, the vibration of the vocal chords is very weak, so that the breathiness is rendered voiceless and the vowel whispered. In rapid and connected speech the final syllable ha can be realized also as **ɦa**.

ehahĩ 'this' (emphatic) **eɦaɦ̱ĩ** *e-ᴴa-ᴴĩ*

or

ẽɦ̱ãɦ̱ĩ

(i) In this word with a final nasal vowel, the two aspirated syllables are realized as described under A. I(*c*), on p. 19, in Monosyllables, the difference being the presence of voice in this case. There are two alternative realizations, in one of which only the final syllable is nasalized, but in the other, nasalization starts right from the beginning of the utterance. The amount of breathiness in the second syllable is greater than that in the third.

A. II. Aspiration with stop

With regard to A. I. Aspiration without stop in trisyllables, it has already been found that two aspirated syllables without stop cannot occur in one and the same word. But with regard to aspiration with stops, it is not unusual that two of them occur in the same word, e.g. 'gəphutha', 'pəḍhichi'. They constitute mainly verbal forms. We have only one example where two successive aspirated syllables contain similar stops ('ləphapha'). But aspirated syllables containing stops can occur in immediate contact with an unaspirated syllable containing similar stops, e.g. 'kəkharu' and 'aṭhəṭa'. The stop with aspiration in the third syllable has generally a lax

articulation and shows a tendency towards friction, specially those of labial series, e.g. 'bərəphə' **bərəɸə**.[1] That also is a feature of the voiced stops with aspiration occurring either in the second or the third syllables. As a matter of fact, the tendency for friction has evidently been so great at some period in the development of Oriya that many words spelt with an aspirated stop in the middle Indo-Aryan languages are now alternatively written with h realized as **ɦ**.

Middle Indo-Aryan		*Oriya*	
gəbhirə	('deep')	gəbhirə, gəhirə	**gəɦirə**
bədhu	('bride')	bədhu, bəhu	**bəɦu**

Aspirated syllables containing velar and labial stops provide some features of interest, while those with stops of other series do so only incidentally. The one example of an aspirated second syllable containing the group provides some additional interest, and as such is described under (*a*) (*see* below, p. 86).

A. II. Aspiration with stops is described under the following categories :

Generalized phonological formula

(*a*) Aspirated second syllable containing voiceless stop (with aspirated third syllable)
Phonematic structure CV-CV-CV $CV\text{-}^{H}PV\text{-}^{H}CV$
Orthog. -ଫ- (-ph-)

(*b*) Aspirated third syllable containing voiceless stop
Phonematic structure CV-CV-CV $CV\text{-}CV\text{-}^{H}PV$
Orthog. -ଖ- (-kh-)

[1] *See* S. K. Chatterjee : 'Baŋgla Bhagatəttver Bhumika', p. 202.

Generalized phonological formula

(*c*) An aspirated syllable containing voiceless stop with the successive unaspirated syllable containing similar stop

Phonematic structure (C)V-CV-CV *(C)V-^{H}PV-PV*

Orthog. -ಠ- (-ṭh-)

(*d*) Two successive non-initial aspirated syllables containing similar voiceless stop

Phonematic structure CV-CV-CV *CV-^{H}PV-^{H}PV*

Orthog. -ಫ- (-ph-)

(*e*) Aspirated second syllable containing voiced stop

Phonematic structure CV-CV-(C)V *CV-^{H}BV-(C)V*

Orthog. -ಘ- (-gh-)

(*f*) Aspirated third syllable containing voiced stop

Phonematic structure (C)V-CV-CV *(C)V-CV-^{H}BV*

Orthog. -ಘ- (-gh-)

Detailed description of the categories follow in order.

(*a*) *Aspirated second syllable containing voiceless stop* (*with aspirated third syllable*)

Phonematic structure CV-CV-CV

Labial -ಫ- (*-ph-*)

gəphutha 'go on speaking' **gəϕutθa̤** *gə-^{H}pu-^{H}ta*

(i) In pronouncing this word, after the articulation of the first vowel, a strong stream of voiceless air flows

through the mouth, producing a friction at the lips, which are pursed together with an opening formed at the centre. This breath stream, accompanied with some voice towards its end (**u**) becomes obstructed by a dental stop slowly opening with friction, and continues without voice till the end of the utterance. The final vowel is whispered. In comparing with other examples having ph in this position, e.g. 'gəphiba' (babbling'), it will be seen that when followed by a stop contained in an unaspirated third syllable, the ph (as in 'gəphiba') can be realized either as a fricative, or as a stop: **gəϕɪβa** or **gəphiβa**.

(ii) In km. No. 24 (gəphutha) there is no suggestion of stops for ph or th, as can be seen in km. No. 11 (phi) and No. 8 (tha). Lack of voice-like wave forms in the section corresponding to the breath of the third syllable suggests that the final vowel is whispered.

-ꞵ̮- (*-phr-*)

aphrika 'Africa' **aϕɾ̥ɪka** *a-^{H}pri-ka*

The combination written -phr- is foreign to the native structure of the language. The monosyllabic word 'phri' (*see* A. II(*b*), in Monosyllables, on p. 28) is an English loan (free), and this trisyllabic word is also a loan word, referring to the Continent of Africa.

(i) In realizing -phri- in the second syllable, while a puff of voiceless air flows through the mouth with a modification at the lips (*see* description above on pp. 85-86), the tongue tip gives taps at the alveolar region. The extra breath passes into the following vowel, making it breathified in the initial portion.

(*b*) *Aspirated third syllable containing voiceless stop*

Phonematic structure CV-CV-CV

gərakhə 'purchaser' **gərʱakˣə̥** *gə-ɾa-^{H}kə*

(i) In realizing this example, a stream of breath begins to flow through mouth immediately the articulating

organs are in position to produce the **r**. After the **r** articulation is complete, the breath stream is momentarily stopped by a velar closure and then released with slight friction. The final **ə** is whispered.

Compare 'gərakhə' with 'goləkhə' (the name of a person), in which the second syllable contains a lateral (**l**). In the latter case, there is hardly any breathiness in the second syllable, but strong friction in the third syllable is evident. The word can be phonetically transcribed as **goləkˣh.**

Palatal -ଛ- (*-ch-*)

Sometimes the phonematic structure mentioned at the head covers a somewhat wide variety of examples. Under the heading 'Aspirated third syllable containing voiceless stop' we have put in examples like

'pəḍhichi'
'khauchi'

without setting up special sub-categories corresponding to the various types of first and second syllables. The point is that we are concerned primarily with the third syllable: peculiarities related to the different types of first and second syllables occurring with the aspirated third syllable are most economically discussed in connection with the individual examples which follow.

pəḍhichi	'has read'	**pəɽɦichi**	*pə-^{H}ḍi-^{H}ci*
khauchi	'is eating'	**kˣhauchi**	*^{H}ka-u-^{H}ci*
gəḍhichi	'has made'	**gəɽɦichi**	*gə-^{H}ḍi-^{H}ci*

(i) In these examples where there is another aspirated syllable besides the third (as shown in writing), there is less breath and affrication in the realization of ch in this context than is heard in **ch** in other contexts, e.g. in **chi** (*see* description under A. II(*a*), in Monosyllables, on p. 25). There is greater breath and friction in the third

syllable when there is no preceding aspirated syllable in the word, as in '**pauchi**', as against '**k^xhauchi**'.

The phonetic distinction between the realization of ch in monosyllables, dissyllables and trisyllables has now gained recognition in Oriya orthography. Ch (ଛ) in the third syllable is being increasingly replaced by the unaspirated counterpart C (ଚ), irrespective of the presence of aspiration in the preceding syllables. Note how the above examples are written now alternatively.[1]

Standard	*Alternative*
pəḍhichi	pəḍhici
khauchi	khauci
pa-uchi	pa-uci

Even though there is comparatively less breathiness in the aspirated third syllable containing stops of all series, it is remarkable that the present orthography has recognized the change only in ch. These words belong to the category of verbs, indicative singular in third person, and occur with great frequency in the language.

Labial -ଫ- (-*ph*-)

bərəphə	'ice'	**bərəϕə**	*bə-rə-^{H}pə*
tərəphə	'side'	**tərəϕə**	*tə-rə-^{H}pə*

(i) For the realization of the third aspirated syllable, *see* description under A. II(*a*), in Trisyllables, on pp. 85-86.

Aspirated third syllable containing labial stop is rare in native Oriya words. Most of such words are adaptations from foreign languages, Hindi, Arabic, Persian, etc.

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[1] *See* S. K. Chatterjee: 'Origin and Development of Bengali Language', p. 442. Besides speaking of Oriya palatal ଛ (ch) (aspirated symbol) being replaced by ଚ (c) (unaspirated symbol), it is observed that this substitution is now an established fact in Bengali also. It has found recognition in the writings of Tagore and others.

Also cf. R. L. Turner: 'Gujrati Phonology in *J.R.A.S.*', 1921, pp. 509-10.

(c) *An aspirated syllable containing voiceless stop with the successive unaspirated syllable containing similar stop*

Phonematic structure (C)V-CV-CV

The only interesting example is provided by the retroflex series, e.g.

aṭhəṭa 'eight' **afiṭạ** *a-ᴴṭ(ə)-ṭa*[1]

or

aṭṭạ

(i) In this example, the vibration of the vocal chords for making the first vowel is reinforced by a stream of air flowing through the mouth, and then it is obstructed by the retroflexed tongue tip pressed against the hard palate. On release of the stop, the tongue lies low in the mouth, with open jaws to make the following **a**, which is whispered. There is an alternative pronunciation, in which the retroflexed tongue tip is held in contact with the hard palate at the appropriate point for a time sufficiently longer[2] than for single intervocalic **-ṭ-** in similar contexts.

(d) *Two successive non-initial aspirated syllables containing similar voiceless stop*

Phonematic structure CV-CV-CV

ləphapha 'envelope' **ləɸɸa** *lə-ᴴpa-ᴴpa*

Such sequences are foreign to Oriya. This is the only example I know. It is a word of very common use.

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[1] The phonological analysis is justified by the alternant **aṭṭạ**. In **afiṭạ** we have a breathiness of the first syllable. But this breathiness is of a type unknown to initial (phonologically) aspirated syllables in Oriya. It is therefore convenient to consider the breathiness as the realization of the aspiration of the second syllable, the sonant of which has zero realization.

[2] *See* S. K. Chatterjee: 'A Brief Sketch of Bengali Phonetics', p. 8, reprinted from *B.S.O.A.S.*, Vol. II, Part I.

(i) In realizing this word, before the first vowel is completely articulated, a stream of voiceless breath flows through the mouth. It escapes at the lips through a groove-shaped aperture and gives rise to friction for a time longer than for an intervocalic -ɸ- in similar context. The vocal chords begin to vibrate some time before the cessation of the stream of breath, so that the final vowel is only partly breathified.

(e) *Aspirated second syllable containing voiced stop*

Phonematic structure (*C*)*V*-*CV*-(*C*)*V*

Velar -ɡ- (-*gh*-)

bəghəra	'spiced'	**bəgɣɦəra**	*bə-ᴴgə-ra*
baghu-a	'pertaining to tiger'	**bagɣɦua**	*ba-ᴴgu-a*

(i) In these examples, the aspirated second syllable is realized with a velar stop followed by a slow release giving rise to friction. The released breath reinforces the following vocalic vibration. This fricative tendency of the voiced stop contained in the non-initial aspirated syllables is more or less present in stops of all series.

Palatal -ʑ- (-*jh*-)

sijhai	'having cooked'	**sijai,** *or* **sijɦai**	*si-ᴴja-i*
pəjhai	'having sharpened'	**pəjai** *or* **pəjɦai**	*pə-ᴴja-i*

(i) In these examples, the aspirated second syllable containing a palatal stop is realized in common parlance as an unaspirated voiced affricate (j). An explosion follows the stop release without any of the extra breath that characterizes all stops contained in aspirated syllables. But in book reading, or rather artificial speech, it has an

alternative realization of the aspirated affricate **jh** (*see* description under A. II(*e*), in Monosyllables, on p. 34).

Labial -ଭ- (*-bh-*)

gəbhirə	'deep'	**gəβʱirə**	*gə-ᴴbi-rə*

(i) The aspirated second syllable containing labial stop in this example has a realization similar to that described under A. II(*a*), in Trisyllables, on pp. 85-86. The only outstanding features are the presence of voice in this case, and some more breathiness. But the breathiness is less than what is found in the realization of bh in the initial position (*see* pp. 35-36 in Monosyllables).

(*f*) *Aspirated third syllable containing voiced stop*

Phonematic structure (*C*)*V-CV-CV*

əmoghə	'infallible'	**əmogɣɦə**	*ə-mo-ᴴgə*
surəbhi	'scented'	**surəβʱi**	*su-rə-ᴴbi*

(i) The voiced stops in the third syllable as present in 'əmoghə' and 'surəbhi' have almost similar realization to what they have in the second syllable as described above (*see* description under A. II(*e*) Velar, on p. 90, in Trisyllables and Labial, just above.

CHAPTER IV

QUADRISYLLABLES

Most common Oriya words are found to be dissyllabic or trisyllabic. The quadrisyllables are generally compound words. They are mostly Skt. 'tətsəmə' words used more in writing than in speech. For the convenience of treating aspiration in quadrisyllabic words, we divide our treatment, as we did in trisyllables, under two headings coming under the main heading: A. Word Isolates.

A. I. Aspiration without stop.
A. II. Aspiration with stop.

A. I. Aspiration without stop (*-h-*)

In treating aspiration without stop in quadrisyllables, it is found that very little is left to be said about it after what has already been stated in the previous section. Previously we had established a rule, with some exceptions, that two aspirated syllables without stop cannot occur in one and the same word. But aspiration without stop proves an exception to that rule here, since two syllables of the phonological structure ^{H}V can occur in a quadrisyllabic word, e.g. 'hahakara' (expression of sorrow) and 'əhərəhə' (always). There is no special feature about the realization of aspiration in the initial syllable, in that the breathy onset by which aspiration is realized is voiceless. Aspiration in the medial syllable may have an alternative realization as voiced **ɦ** or as voiceless **h**, as in 'itihasə' (history), pronounced **itihasə** or **itiɦasə**. It is stressed that we have not attempted to describe any sequence which has not provided any specific interest.

A. II. Aspiration with stop

In considering quadrisyllabic examples with aspirated syllables containing stops, care has been taken to select words with two such syllables, since the presence of one aspirated syllable with stop (excepting a few examples in (*f*)) provides no additional interest. In trisyllables, barring one example (ləphapha), two successive aspirated syllables containing similar stop did not occur. But in quadrisyllables, it is not unusual to find this occurring, e.g. 'akhukhai' (cane-pressing machine) and 'gəchəcha-i' (shade of a tree). Words with aspirated syllables, containing stops in immediate contact with unaspirated syllables having similar stops, are found here in greater number than in trisyllables. Such examples are 'bəḍəḍhaḷə' (big jar) and 'ədhadərə' (half rate). We have found no examples where aspirated syllables containing stops occur in both the first and the second positions. Aspiration with stop may appear in any one of these, e.g. 'əbhibhutə' (engrossed) and 'bhabədhara' (line of thought). The final vowel in quadrisyllables is whispered in the last part, diminishing into silence.

A. II. Aspiration with stop is described under the following categories.[1]

		Generalized phonological formula
(*a*) Aspirated second syllable containing voiceless stop		
Phonematic structure	(C)V-CV-CV-(C)V	*(C)V-^{H}PV-^{H}CV-(C)V*
Orthog. -ಖ- (-kh-)		
(*b*) Aspirated fourth syllable containing voiceless stop		

[1] In the descriptive labels of these categories, no statement about the other aspirated syllables has been included. But that is indicated in the general phonological formula.

Generalized phonological formula

Phonematic structure (C)V-CV-(C)V-CV — $(C)V\text{-}{}^{H}CV\text{-}(C)V\text{-}{}^{H}PV$

Orthog. -ଫ- (-ph-)

(*c*) Two successive aspirated syllables containing similar voiceless stop

Phonematic structure CV-CV-CV-(C)V — $CV\text{-}{}^{H}PV\text{-}{}^{H}PV\text{-}CV$

Orthog. -ଛ- (-ch-)

(*d*) An unaspirated syllable containing voiceless stop with a successive aspirated syllable containing similar stop

Phonematic structure CV-CV-CV-CV — $CV\text{-}{}^{H}CV\text{-}PV\text{-}{}^{H}PV$

Orthog. -ତ-, -ଥ-
(-t-), (-th)

(*e*) Two successive aspirated syllables containing voiced stops

Phonematic structure CV-CV-CV-(C)V — $CV\text{-}{}^{H}BV\text{-}{}^{H}BV\text{-}(C)V$

Orthog. -ଘ- (-gh-)

(*f*) An unaspirated syllable containing voiced stop with a successive aspirated syllable containing similar stop

Phonematic structure CV-CV-CV-(C)V — $CV\text{-}BV\text{-}{}^{H}BV\text{-}(C)V$

Orthog. -ଡ-, -ଢ-
(-ḍ-), (-ḍh-)

Detailed description of the different categories follows in order. Any sequence in which aspiration with stop can occur, but has not been described, is to be understood as of no specific interest from the point of view of phonetic realization.

(*a*) *Aspirated second syllable containing voiceless stop*

Phonematic structure (*C*)*V*-*CV*-*CV*-(*C*)*V*

Velar -ଖ- (-kh-)

akhithiba 'one having eyes' **akçitθiβa** *a-*^{H}*ki-*^{H}*ti-ba*

(i) In realizing this word, after the formation of the first vowel **a**, a velar stop is made further forward than for **kˣh-** in other contexts. The stop is released with a stream of voiceless breath flowing through the mouth. It passes first through a slit-shaped palatal constriction, and then is stopped by a dental occlusion and slowly released. The vocal chords begin to vibrate during the later part of the formation of the third vowel **i**, and continue while the breath passes between the lips with some friction (**β**). The vibration of the vocal chords is very weak during the articulation of the final vowel.

Palatals -ଛ- (-ch-)

machəjhoɭə 'fish soup' **macjɦoɭə** *ma-*^{H}*cə-*^{H}*jo-ɭə*[1]
maɦjɦoɭə

(i) In pronouncing this word, after the articulation of the first vowel **a**, a palatal stop (long enough for a double consonant) is made, during the first part of which there is no voice. The vocal chords begin to vibrate towards the end of the stop, on the slow release of which a stream

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[1] The phonological analysis of the second syllable -^{H}*cə*- can easily be justified by '**macjɦoɭə**'. In the alternant '**maɦjɦoɭə**' we have breathiness of the first syllable which is unknown to the initial (phonologically) aspirated syllable in Oriya. We can conveniently consider this breathiness as the realization of the second syllable, the sonant of which has zero realization.

of air passes through the mouth and reinforces the vibration of the vowel **o**. In this type of pronunciation, what is orthographically represented as ch is realized as an unreleased stop, the following -o- having zero phonetic realization. In quick and careless speech, ch is alternatively realized as **ɦ**.

Retroflex -ଠ- (*-ṭh-*)

uṭhuthila 'was rising' **uḍ̥ʰtθila** *u-ᴴṭu-ᴴti-la*

(i) In this example, after the formation of the first vowel, the tongue tip is slightly curled up and makes contact at the alveolar region. Immediately after the contact is released with very slight breathiness, another stop is made at the upper teeth by the tongue tip. The stop is then released with a stream of air escaping slowly through the mouth, and rendering the second vowel **i** breathified.

(*b*) *Aspirated fourth syllable containing voiceless stop*

Phonematic structure (*C*)*V*-*CV*-(*C*)*V*-*CV*

An aspirated fourth syllable containing a labial stop is not common among Oriya words. It belongs to foreign words of Perso-Arabic origin.

gɔphəsɔphə 'talk' **gəɸəsəɸə** *gɔ-ᴴPə-sɔ-ᴴPə*
or **gəɸəsəpə**

(i) The consonants in the aspirated syllables are realized as bilabial fricatives (*see* under A. II(*d*), in Trisyllables, on p. 89). But the final stop may alternatively be realized as a bilabial stop.

(*c*) *Two successive aspirated syllables containing similar voiceless stop*

Phonematic structure *CV*-*CV*-*CV*-(*C*)*V*

gəchəcha-i 'shade of a tree' **gəɦcchai** *gə-ᴴcɔ-ᴴca-i*

(i) In realizing this word, the glottal vibration of the first vowel **ə** is reinforced by a stream of air, which is soon

checked by a palatal stop. The stop is maintained longer than for a single intervocalic -**c**- in similar contexts, on the slow release of which a stream of air escapes through the mouth, and renders the vowel **a** breathified.

Thus in this sequence, there is only one plosion for the two voiceless stops presented in orthography.

For the zero realization of the sonant of the first aspirated syllable, and the realization of aspiration as the breathiness of the preceding vowel, *see* above '**maɦjɦoɭə**' under A. II(*a*), Palatal, on p. 96.

(*d*) *An unaspirated syllable containing voiceless stop with a successive aspirated syllable containing similar stop*

Phonematic structure CV-CV-CV-CV

jəthatətha 'anyhow' **jətθattha̤** *jə-^{H}ta-tə-^{H}ta*

This example is a compound of two words 'jətha' and 'tətha'. The second word of the compound has very different realization according to whether it is an isolate word or the second member of a compound. We are here concerned with the compound.

(i) After the initial syllable **jə-**, there is a voiceless dental stop with slow breathy release. The **a** vowel of the second syllable is followed by a dental stop of relatively greater duration than for a single intervocalic -**t**- in similar contexts (represented by tt). The release is accompanied by strong breath. The final vowel is whispered.

(*e*) *Two successive aspirated syllables containing voiced stops*

Phonematic structure CV-CV-CV-(C)V

Velar -ɡ- (-gh-)

baghəgha-i 'the tiger's track' **bayɡyɦai** *ba-^{H}gə-^{H}ga-i*

(i) In this word the sequence orthographically represented as -gh- is realized with a strong breath stream

passing through a constriction formed in the velar region. For the second -gh- the breath-stream is checked by a velar stop and then released through a gradually opening aperture, producing friction. There is greater breathiness in the second aspirated syllable than in the first.

Labial -ಭ- (*-bh-*)

obhibhutə 'engrossed' **əβⁿiβⁿutə** *ə-ᴴbi-ᴴbu-tə*

or

əɦiβⁿutə

(i) For the description of the aspirated second and third syllables containing a labial stop, *see* A. II(*d*), under Trisyllables, on p. 89. The only difference is the presence of voice in this case. The amount of breath in the second syllable is greater than that in the third. In quick and careless speech, the second consonant has the possibility of being realized only as **ɦ**.

(*f*) *An unaspirated syllable containing voiced stop with a successive aspirated syllable containing similar stop*

Phonematic structure CV-CV-CV-(C)V

Retroflex -ಢ- (*-ḍh-*)

bəḍəḍhaḷə 'big jar' **bəḍḍɦaḷə** *bə-ḍə-ᴴḍa-ḷə*

(i) In this word, the sequence -ḍəḍha- is realized with the retroflexed tongue tip making a stop in the prepalatal post-alveolar area for a time longer than for a single inter-vocalic -ḍ- in similar contexts. On release of the stop, the initial part of the released breath is voiceless, but becomes voiced towards the end, as it reinforces the glottal vibration for the vowel **a**.

Chapter V

(B) WORD JUNCTION

In the first chapter we found it convenient to state the treatment of aspiration under two broad headings: (A) Word Isolates, and (B) Word Junction. So far we have dealt with aspiration in word isolates, and now it remains to be seen how aspiration is realized in word junction. Phenomena relating to the way in which sounds are joined together are summarized under the term junction.[1] Languages differ greatly in their habits of junction. In some languages the segmentation is supported by more abrupt changes in the continuum: but even in languages where the changes are abrupt in word isolates and at slow speed, they may be blurred at high speed and in connected utterance. It is not within the scope of our study to see the junction habits of the Oriya words in all possible sequences but only in regard to aspiration. Some very common junction habits in Oriya may here be noted. Since Oriya syllables are generally open, i.e. of the pattern V or CV, the formation of consonant groups is not usual. Except in the Sanskrit 'tətsəmə' or foreign loan words the occurrence of consonantal groups in a word in quick speech will suggest the presence of word junction. The final ɔ with which Oriya consonants are characterized (where no other vowel is used) generally in quick speech has zero phonetic realization. Since many of the Oriya trisyllabic and quadrisyllabic words are formed by junction of one kind and another, we have already stated some

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[1] *See* Banard Block, George L. Trager: 'Outline of Linguistic Analysis', p. 35.

features of aspiration in inter-word junction, which corresponds so fully with the features of word junction that the latter need not be repeated here. For instance, in a phrase 'bibahohəla' (marriage was performed) we have a junction of two aspirated syllables without stop. The mode of realizing aspiration here has a close similarity to what has already been stated with regard to words like 'ahaha' (under A. I(*d*), in Trisyllables, on p. 82) which is only a compound of two independent morphemes 'aha' and 'ha'. 'gəchəcha-i' (shade of a tree) is an instance where two aspirated syllables containing voiceless stops come into junction (*see* A. II(*c*), in Quadrisyllables, on p. 97). In this chapter by 'first syllable' and 'second syllable' we refer to the first syllable and second syllable of the junction (not of the words involved in the junction). The two syllables are linked by a ligature ‿. We can divide our treatment of junction into three broad headings :

(I) Junction in which one of the two syllables is an aspirated syllable without stop.

Orthog. ହ (h)

(II) Junction in which one of the two syllables is an aspirated syllable with stop.

Orthog. ଖ, ଛ, ଘ, ଧ
(kh), (ch), (gh), (dh), etc.

(III) Junction in which both the syllables are aspirated with and without stop.

Under the third category we will meet with many examples of word junctions which are closely similar to what has been stated in quadrisyllables, e.g.

Quadrisyllabic words	*Word Junction*
gəchəcha-i **gəⁿcchai**	gəchə‿chiḍa hoichi **gəⁿcchiṛaɦoicʰi**
(shade of a tree)	(the tree is standing)

See description under Quadrisyllables on p. 97.

baghəgha-i	**baγgγɦai**	baghə‿ghəre bilua	**baγgγɦərebilʷa**
(the tiger's track)		(the jackal in the tiger's den)	

See description under Quadrisyllables on pp. 98-99.

B. I. Junction in which one of the two syllables is an aspirated syllable without stop can be described under the following sub-categories :

(*a*) Junction in which the first syllable is an aspirated syllable without stop.

(*b*) Junction in which the second syllable is an aspirated syllable without stop.

(*c*) Junction with silence in which the aspirated syllable without stop is either (1) the initial, or (2) the final syllable of a sentence.

It may be noted that the descriptive labels of these categories do not include any statement about the specific nature of the other syllable, as it would be uneconomical to describe each of them, especially when they do not seem to affect or to be affected phonetically by the aspirated syllable.

Detailed description of the categories follow in order.

(*a*) *Junction in which the first syllable is an aspirated syllable without stop*

kaha‿kətha	**kaakətθa**	'about whom'
ehi‿goruku	**eigoruku**	'to this cow'
kaha‿mənə	**kaamənə**	'whose mind'
sehi‿ṭokaṭa	**seiṭokaṭa**	'that chap'
kaha‿dokanə	**kaaðokanə**	'whose shop'

(i) In this type of junction, where the first syllable corresponds in word isolates to a final syllable with a breathy voice, is realized in the junction without any breathiness whatsoever.

It may be noted that the words in which the absence of aspiration occurs are either nouns and pronouns, but there are a number of words in the language, where the aspiration in this syllable persists and is realized as voiced breathiness, e.g.

mɔha ṭhɔkɔ **məɦaʈhəkə** 'great cheat'
aha boli **aɦaβoli** 'expressing sorrow'

It has not been possible within the scope of the present study to arrive at any principle of categorizing words in which the aspiration in this position vanishes or persists. In general, it may be said that the tendency of the aspiration to vanish is perhaps checked where there is a danger of creating homophones with some other word. In the following phrases if the aspiration is made to vanish the meaning will be entirely different.

With aspiration

aha boli **aɦaβoli** 'expressing sorrow'
jahi kɔrɔ **jaɦikərə** 'do what you like'

Without aspiration

aa boli **aaβoli** 'telling to come'
ja-i kɔrə **jaikərə** 'make some pulses'

(*b*) *Junction in which the second syllable is an aspirated syllable without stop*

pakhɔ he-uchi **pak^{x}həɦeuc^{h}i** 'becoming nearer'
pagɔ he-uchi **pagəɦeuc^{h}i** 'becoming ready'
bɔɖha hela **βəɽɦaɦela** 'was served'
kaɭɔ hela **kaɭəɦela** 'time came'

(i) In this type of junction, where the second syllable corresponds in word isolates to an initial syllable with a voiceless breathy onglide, the transition is marked by a voiced breathiness (**ɦ**).

(c) *Junction with silence in which the aspirated syllable without stop is either* (1) *the initial, or* (2) *the final syllable*

(1) *Junction of the initial syllable*

We have seen in Monosyllables and Dissyllables that in words beginning with a written h, aspiration is realized as voiceless breathiness. In a sentence all written h are realized as voiced (**ɦ**) except the initial h of the initial word. But in quick speech this initial h has also the possibility of being realized as voiced (**ɦ**), e.g.

həri kəhuthila **ɦərikəɦutθila** 'Hari was saying'

(2) *Junction of the final syllable*

se ghəre nahĩ **segɦərenãĩ** 'He is not at home'
se kahĩ **sekãĩ** 'Where is he?'

(i) In these examples the final syllable has zero phonetic realization of the aspiration which is realized as voiced breathiness in word isolates.

It may be noted that the absence of aspiration in words written with h is being increasingly recognized in the orthography on two levels (*a*) in the writings of half-educated people, (*b*) in the works of writers, who prefer to introduce colloquialism into their writings, e.g.

Standard form	*Substituted form*
nahĩ	naĩ
kahĩ	kaĩ

B. II. Junction in which one of the two syllables is an aspirated syllable with stop can be described under the following sub-categories:

(*a*) Junction in which the first syllable is an aspirated syllable with stop.

(*b*) Junction in which the second syllable is an aspirated syllable with stop.

(*c*) Junction with silence in which the aspirated syllable with stop is either the initial or final syllable of a sentence.

Detailed description follows in order.

(*a*) *Junction in which the first syllable is an aspirated syllable with stop*

For convenience of treatment we can consider together all those examples in which (1) the first syllable is with voiceless stop, and (2) where the first syllable is with voiced stop.

(1) *The first aspirated syllable with voiceless stop*

We have examined junctions with syllables containing various stops, kh, ch, ṭh, th, ph. The syllable with which we are mainly concerned under this category has in most cases ɔ vowel, since this is the Oriya vowel which most often undergoes modification or loss.

Velar

kakhə‿kərə **kaɦkərə** 'take into the lap'

or

kaɦkkərə

(i) In this example, where the junction sequence is -^{H}*kə/kə-*, the H prosody is dominant in the first syllable, which having zero realization of the sonant is represented simply by a breathiness of the preceding **a**. There is an alternative realization in which the velar stop can be treated as geminate with extra breathiness in the first vowel.

Palatal

pɔche‿jibi **pəɦeʒiβi** 'I will go later'

or

pəɦʒʒiβi

(i) In this junction, as in the previous example, the H prosody is dominant in the first syllable in which the consonant is represented by a breathiness of the vowel **ə**. The consonant of the second syllable is realized with friction. In the alternative realization, the aspirated syllable is represented by gemination of the **ʒ** with extra breathiness in the first vowel. The second type is associated with quick speech.

Retroflex

paṭhə‿ḍakila **paɦḍakila** 'the calculation turned'

or

paɦḍḍakila

(i) In this example, the first syllable with zero phonetic realization of the sonant is represented only as a voiced breathiness of the preceding vowel **a**. Alternatively the first syllable is represented as a gemination of **ḍ** with extra breathiness in the preceding vowel **a**.

Dental

kəthа‿dei **kətθaðei** 'having given words'

(i) In this example, where the junction sequence is -^{H}*ta/de*-, the first syllable is realized with a dental affricate. The consonant of the second syllable is realized with friction.

Labial

rəpha‿kəridiə	**rəɸakəriðiə**	'make decision' or 'compromise'
gəphə‿calu	**gəɸcalu**	'let the talking go on'
dəpha‿ʃeṣə	**dəɸasesə**	'the end of the event'

(i) In these examples, the aspirated syllable is realized with friction of the consonant and with zero realization of the sonant, if this is **ə** in the word isolate. The degree of

breathiness in ɸ varies in different examples. In the first example here, there is in ɸ a little more than the minimal breathiness generally associated with ɸ.

(2) *The first aspirated syllable with voiced stop*

With regard to the first aspirated syllable with voiced stop, in quick and connected speech, the consonant is generally realized as a fricative. As will be seen from the descriptions below, in some series the aspirated syllable can be represented only by breathiness. In the retroflex series the flapped retroflex does not show any remarkable change at the junction. Junctions where stops of the same type occur provide examples of additional interest. Examples of various series are described in order.

Velar

megho‿kəruchi	**mefikəruchi**	'it is raining'
	or	
	me̤kkəruchi	
bagha‿gəla	**bafigəla**	'a tiger passed'
	or	
	ba̤ggəla	

(i) For the realization of the junction of these examples, *see* under B. II(*a*), (1) Velar, on p. 106. The only difference is the presence of voice throughout in the second example.

Palatal

bujhi‿calutha	**βufiicalutθa**	'take care while walking'
bujhi‿jibaru	**βufiiʒiβaru**	'on having understood'

(i) In these examples, the H prosody is dominant in the first syllable in which the consonant is represented simply by voiced breathiness.

Dental

ədha‿tərəkari	**əða̤tərkari**	'half the curry'
ədha‿dərəma	**əðɦaðərəma**	'half the pay'

(i) In these examples, the aspirated syllable is realized with the friction of the consonant and with an extra breathiness present in it.

Labial

sɔbha‿kɔrɔ **səβɦakərə** 'hold a meeting'

gɔbha‿jau **gəβɦaʒau** 'let Gabha go'

(i) The aspirated syllable is realized with friction of the consonant and with an extra amount of breathiness present in it.

(*b*) *Junction in which the second syllable is an aspirated syllable with stop. The stop may be* (1) *voiceless or* (2) *voiced.* They are considered in order.

(1) *The aspirated syllable with voiceless stop*

In this position a stop articulation has less tendency to be replaced by a fricative articulation than in the first position (*see* under B. II(*a*), (1), on pp. 105–106). This type of junction shows the same features as stated before, i.e.

(*a*) loss of the **ə** vowel in junction, e.g.

mɔdɔ‿chaḍɔ **mədchaɽə** 'give up the wine'

where the **ə** in the junction undergoes loss.

(*b*) representation of a syllable by gemination, e.g.

nacɔ‿chɔḍa **nacchəɽa** 'excepting dance'

where the first syllable is represented as the gemination of **c**.

(2) *The aspirated syllable with voiced stop*

In this category only the labial stop in the second syllable seems to be affected. But in junction with other series it is the first syllable that undergoes some change.

Velar

jibɔ‿ghɔrɔku **jiβəgɦərku.** 'will you go home?'

(i) In this junction the first syllable is realized with friction made at the lips. Alternatively it can be realized as a **w** glide. The second syllable does not show any friction.

Dental

batə‿dhərichi **βaddɦərichi** 'attacked by rheumatism'

(i) In this example the voiceless stop of the first syllable is assimilated to the following voiced stop.

Labial

jogi‿bhikari **jogiβɦikari** 'beggars and wanderers'

(i) In this junction, the consonant in the aspirated syllable is realized as a bilabial fricative accompanied by more than the minimal breathiness generally associated with fricative articulation.

(*c*) *Junction with silence in which the aspirated syllable with stop is either the initial or the final syllable of a sentence*

At the beginning of a sentence aspirated syllables containing stops of various types have realization similar to what they have initially in word isolates. At the end of a sentence, of all the series of stops the voiceless palatals show definite reduction of breathiness. The voiced dental stop and both the voiced and voiceless labial stops show definite tendency towards friction as when they are in interword positions.

Palatal

se khauchi **sekˣhauchi** 'he is eating'
mũ jauchi **mũʒauchi** 'I am going'

(i) For the realization of the final ch, *see* description under A. II(*b*), Palatals, in Trisyllables, on p. 87.

Dental

tu kəribu ədha **tukəriβuəðɦa** 'you will do half'

(i) *See* description of the realization of dh under B. II(*a*), (2) Dental, on p. 108. The only difference is the presence of an extra degree of breathiness in this case.

Labial

(*a*) so eɖe gopha **seeɽegəɸa** 'he is so talkative'
(*b*) keũʈhi səbha **kẽũʈhisəβ^{ɦ}a** 'where is the meeting ?'

(i) For the description of the final syllable in (*a*) *see* under B. II(*a*), (1) Labial, on p. 107, and in (*b*) *see* under B. II(*a*), (2) Labial, on p. 109.

B. III. Junction in which both syllables are aspirated with and without stop can be divided into two subcategories:

(*a*) Junction in which both syllables are aspirated syllables without stop.
(*b*) Junction in which both syllables are aspirated syllables with stop.

Detailed description follows in order.

(*a*) *Junction in which both syllables are aspirated syllables without stop*

baha‿heba **baaɦeβa** 'to be married'
or
baɦaɦeβa
saha‿heba **saaɦeβa** 'to be a help'
or
saɦaɦeβa

(i) In these examples, where the first syllable corresponds in word isolates to a final syllable with breathy voice, it is realized without any breathiness whatsoever. Aspiration in the second syllable of the junction is realized as voiced breathiness. This pronunciation of these examples is natural with me. But in learned speech the aspiration of the first syllable has an alternative realization as voiced breathiness.

(*b*) *Junction in which both syllables are aspirated syllables with stop can be subdivided under three heads*

(1) Junction in which both syllables are aspirated syllables with voiceless stop.
(2) Junction in which both syllables are aspirated syllables with voiced stop.
(3) Junction in which one aspirated syllable is with voiced stop, the other with voiceless stop.

Detailed description follows in order.

(1) *Junction in which both syllables are aspirated syllables with voiceless stop*

About the junction in which both the aspirated syllables contain voiceless stop, it may be said in general that the palatal stop (ch) does not show any great change except when it occurs with stops of its own kind, e.g.

cf. pəchə‿chuaṭa **pəⁿcchuaṭa** 'the later child'
with gəchəcha-i **gəⁿcchai**

as described under A. II(*c*), in Quadrisyllables, on pp. 97-98.

The retroflex ṭh in examples

akhi‿ṭharila **akçiṭharila** 'gave sign by the eye'
piṭhi‿chuĩla **piṭhichũĩla** 'touched the back'

undergoes no modification by reason of its nearness to another aspirated stop. For the description of **kç** in the first example, *see* under A. II(*a*) Velar, in Quadrisyllables, on p. 96. The stops which show great tendency towards friction belong to the labial and dental series.

akhi‿thibaru **akçitθiβaru** 'on account of having eyes'
kəthа‿thila **kətθatθila** 'there was an appointment'
akhi‿phiṭini **akçiɸiṭini** 'the eyes have not opened'

In junctions of this type both the aspirated syllables carry almost the same amount of breath.

(2) *Junction in which both syllables are aspirated syllables with voiced stop*

On examining junction sequence with various voiced stops no peculiarity solely belonging to the junction of two aspirated syllables containing voiced stops has been detected. Where in the isolate form we find a voiced velar, dental and labial stop, in juncture, we generally find a fricative and in some cases simply voiced breathiness, e.g.

budha ghəraku **βuɽɦaɣ^ɦərku** 'to the old man's house'

or

βuɽɦaɦərku

pəgha dhərija **pəɣ^ɦað^ɦəriʒa** 'go with the rope'

Other examples with fricative tendency may be seen in the following examples:

Labials and Dentals

e.g. ʃobha ghəru gəla **soβ^ɦaɣ^ɦərugəla** 'Sobha went away from home'

gəbha dhərichi **gəβ^ɦað^ɦəric^hi** 'Gabha has caught'

(3) *Junction in which one aspirated syllable is with voiced stop, the other with voiceless stop*

Velar

baghə khauchi **βaɦək^xhauc^hi** 'the tiger is eating'

bujhi chiḍa huə **βuɦichiɽaɦuə** 'stand with care'

ṭəbha phaḷəkəkha **ṭəɦaɸaḷəkək^xha** 'eat this portion of sour orange'

In all these examples the aspirated voiced consonant has been represented only by voiced breathiness.

In treating junction, even with regard to only one feature of aspiration, we do not claim to have exhausted all possibilities of junction. An account of junctions in the most

representative cases has been attempted here. From what has already been examined, it appears that in aspirated syllables there is a tendency for stop articulations to be replaced by fricative or affricate articulation, in some cases even by breathiness alone. In fact many of the Sanskrit words current in Oriya have an alternative orthographic representation: one with stop and the other without it.

	Skt.	*Oriya*
e.g.	mədhu 'honey'	mədhu, məhu
	sadhu 'saint'	sadhu, sahu

This seems to support the persistence, from the diachronic point of view, of the prosody of aspiration as against phonematic units.

PHONETIC TEXTS

WITH

TRANSLATION

A detailed phonetic interpretation of the Oriya vowels is not within the scope of our study in this dissertation. But it seems useful to acquaint the reader, in a general way, with the nature of the Oriya vowels by a diagrammatic representation of them all in order to facilitate interpretation of the following phonetic texts. In the diagram given below, the tongue positions of the Oriya vowels are compared with those of the eight cardinal vowels. They are intended to give an approximate idea of the various vowel symbols employed. The area encircled round each vowel in the diagram indicates the approximate range of that vowel. The arrows indicate the range of movement of the diphthongs.

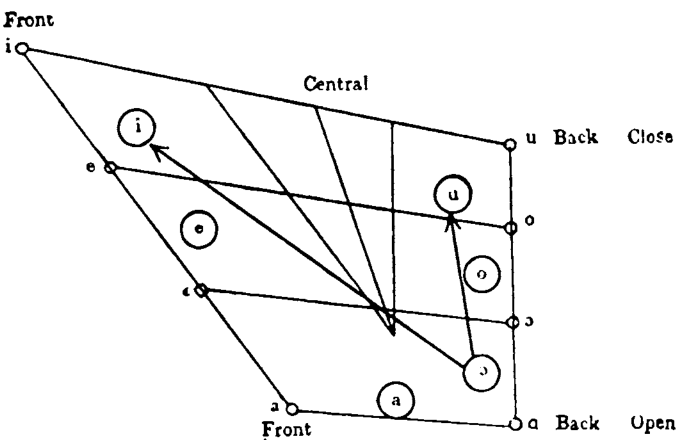


Diagram showing the formation of Oriya vowels

(The cardinal vowel diagram adopted from D. Jones: 'An English Pronouncing Dictionary')

In transcribing the passages given in the following pages, narrow phonetic transcription, in thick phonetic letters, is given below each line of roman transliteration. This is done with a view to show by contrast the difference between the 'phonemic' and phonetic representation of

the Oriya speech. The Oriya orthography as presented in roman letters is practically 'phonemic'. Besides the English translation of the extracts added at the end, we have also given an interlinear word-for-word translation.

It may be noted that foreign loan words with final consonants are pronounced without the characteristic **ɔ** glide at the end, e.g. **bəɽlaṭ** and **tɔrɔɸ**. Many words, realized with the **ɔ** glide when pronounced in isolation, lose the glide in connected speech.

TEXT I

An extract adapted from Gruhələkʂmi, *Ch. VIII, p. 50, written by Jagabandhu Sing*

WIFE. hə-ihe, 'di : pika' kagəjəre lekhathila-,
hɔifie, dipika kagɔʒre lekˣhatθila-,
he! Dipika paper in writing was-,

ni : ḷəməṇi senapəti bilatə gəle. ke-ũṭhi
niḷɔmɔṇi senapɔti βilat gɔle. kẽũṭhi
Nilamani Senapati Bilat went. Where

bilatə?
βilatɔ?
Bilat?

HUSBAND. bilatə ke-ũṭhi jaṇi nahə̃? ĩrejire
βilat kẽũṭhi ʒaṇi nãã? iŋgreʒire
Bilat where know not? English in

ləṇḍənə kəhənti ləṇḍənə goṭi-e səhərə,
lɔṇḍɔn kɔɦɔnti lɔṇḍɔn goṭie sɔɦɔrɔ
London say London one city,

e səhərə ĩləṇḍə desərə rajədhani:
e sɔɦɔr iŋglɔṇḍ desɔr raẓḍɦani
this city England country-of capital.

WIFE. rajədhani: kəɳə?
razḍɦani kɔɳ?
Capital What?

HUSBAND. je-ũṭhare raja rəhənti, taku rajədhani:
jẽũṭhare raʒa rɔɦɔnti, tag̃u razḍhani
Where King stay, it capital

kuhaja-e. kəṭəkə oḍiʃarə rajədhani:,
kuɦaʒae kɔṭɔk oṭisar razḍhani,
is saying goes. Cuttack Orissa of capital,

kəlikətə bəŋgəḷarə rajədhani. dilli:
kɔlkɔta βɔŋgḷar razḍhani dili
Calcutta Bengal of capital Delhi

bharətəbərʂərə rajədhani:, ləɳḍənə
βʱartʷɔrsɔr razḍhani, lɔɳḍɔn
India of capital, London

briṭiʃəsamrajyərə rajədhani:, ehipəri
briṭissamraʒyɔr razḍhani, eipɔri
British Empire of capital, thus

rəja je-ũṭhi rəhənti, taku rajədhani:
rɔʒa ʒẽũṭhi rɔɦɔnti, tag̃u razḍhani
king where stay, it capital

kuhaja-e
kuɦaʒae
saying goes.

WIFE. amərə rəja ki-e ki?
amɔr rɔʒa kˣiyeki?
our king who?

HUSBAND. bərtəmanə raja ʂəʂṭhəjərjjə
βɔrtʷãn raʒa sɔsṭɔjɔrj
now King Sixth George.

WIFE. se ke-ũṭhi thanti ?
se kẽũʈhi thanti ?
he where stay ?

HUSBAND. se bilatəre thanti
se βilatre thanti
he 'Bilat'-in stay

WIFE. tebe bilatə tə rajədhani: hela,
teβe βilattɔ razḍhani ɦela,
then 'Bilat' if capital became,

kəlikəta, kəṭəkə, dilli: eguḍikə
kɔlikɔta, kɔʈɔkɔ, dili eguʈiɡ̊
Calcutta, Cuttack, Delhi these

rajədhani boli kəṇə kəhilə ?
razḍhani βoli kɔŋ kɔɦilɔ ?
capital as what said ?

HUSBAND. eṭhare rəjaṇkə tərəphə prətinidhi
eʈhare rɔʒaŋk tɔrɔɸ prɔtiniðɦi
here King-of behalf representative

rəhichənti
rɔɦichɔnti
stay.

WIFE. rajəprətinidhi puṇi kəṇə ?
razprɔtiniðɦi puɳi kɔɳ ?
royal-representative again what ?

HUSBAND. ahe, Irejəmanəṇkə rajyəre surjyə
aɦe, iŋgreʒmanŋk raʒy[1]ere surʒyɔ
well, English-people-of country-in sun

əstə hu-ənti nahĩ surjyə pruthibi: rə
ɔstɔ ɦuɔnti nãĩ surʒyɔ prutθiβir
setting becomes not. sun earth-of

---

[1] *See* note on transcription [on ə on p. 4]

jeũ-aḍe jibe, se aḍe taṇkərə
ʒẽũaɽe ʒiβe, se aɽe taŋkɔr
which-side go, that side their

rajyə əchi. eḍe bəḍə rəja tə
raʒyə ɔcʰi. eɽe βəɽɔ rɔʒa tɔ
kingdom is. so big king then

jəṇe məṇisə, se kipəri bujhi
ʒɔṇe mə̃ṇisə, se kipɔri βuʒʱi
one man, he how administrate

paribe ? se jəṇe jəṇe sasənəkərta
pariβe ? se ʒɔṇe ʒɔṇe sasɔnkɔrta
can ? he one one administrator

rəkhichənti semane rəjaṇkə tərəphəru
rɔkçicʰɔnti semane rɔʒaŋk tɔrɔɸru
keep. they king's behalf

rajyə bujhənti ənekə kərməcari :
raʒyɔ buʒʱɔnti ɔnek kɔrmɔcari
state administrate many servants

əchənti, dekhə jilake jəṇe lekha-ẽ
ɔcʰɔnti, dekˣɔ, ʒilake ʒɔṇe lekˣãẽ
are, see, district-in one each.

mejestərə sahebə, taṇkə upəre
meʒestɔr saɦeβ, taŋkɔ upre[1]
magistrate sahib, him upon

kəmisənərə, sahebə taṇkə upəre
kɔmisɔnɔr saɦeβ taŋkɔ upre
commissioner sahib. him upon

gəbhərnərə, puṇi səbu gəbhərnərəṇkə
gɔβʱɔrnɔr, puṇi sɔβu gɔβʱɔrnɔrɔŋk
governor. again all governors-of

---

[1] upre can be alternatively realized as **upere**.

upəre jəṇẽ bha-isirəyə. emanəṇkə
upre ʒɔṇe βɦaisrɔe emanŋk
upon one viceroy. these-of

ədhinəre səhə səhə kiraṇi : əmela
ɔdɦinɔre sɔ sɔ kiraṇi ɔmla
control-in hundred hundred clerk official

əchənti. bha-isiriyəṇku bəḍəlatə sahebə
ɔcɦɔnti. βɦaisrɔyɔŋku βɔṛlaṭ saɦeβ
are viceroy-to 'Badlat' sahib

kəhənti je jaha upəraku siḍi bəndha
kɔɦɔnti ʒe ʒaɦa upru[1]ɡ̊u siṛi βɔndɦa
say Who whose upon ladder tied

ho-ichi. je jaha upərə hakimə, se
ɦoicɦi. ʒe ʒaɦa upɔr ɦakim, se
has been. Who whose high official, he

ta kamə tədarəkhə kəre. bilatəre
ta kamɔ tɔdarɔkˣ kɔre. βilatre
his work inspection does 'Bilat'-in

goṭi-e səbha əchi, taku parliamenṭə
goṭie sɔβɦa ɔcʰi, taɡ̊u paliamenṭ
one assembly is, it parliament

səbha kəhənt se səbha jaha kəhibə,
sɔβɦa kɔɦɔnt se sɔβɦa ʒaɦa kɔɦiβɔ,
assembly they that assembly what will say

rəja se kətha kaṭi paribe nai seṭhare
rɔʒa se kɔtθa kaṭi pariβe nãi seṭhare
king that talk cut can not there-in

bharətə pa-ĩ məntrisəbha əchi. se səbha
βɦarɔtpãĩ mɔ̃trisɔβɦa ɔcʰi. se sɔβɦa
India-for Cabinet is. that assembly

---

[1] *See* note on transcription [on ə on p. 4]

bəḍəlatəṇk	upəre	malikə,	se	səbha
βɔɽlaʈŋk	**upre**	**malikˣ,**	**se**	**sɔβʱa**
viceroy-of	on	master,	that	assembly

jepəri	hukumə	debə	bharətəre
ʒepɔri	**ɦukum**	**deβɔ**	**βʱarɔtre**
as	order	give	India-in

kərməcarimane	sehipəri	kamə	kəribe.
kɔrmɔcarimane	**seipɔri**	**kam**	**kɔriβe.**
official-all	so	work	will-do.

TEXT II

An extract of my letter from London published in the College magazine, Sambalpur College, Orissa, 1950

ləṇḍən	ciṭhi
lɔṇḍɔn	**ciʈhi**
London	letter

səmpadəkə	məhaʃəyə,	sadərə	nəməste.
sɔmpadɔg	**mɔɦasɔe,**	**saðɔr**	**nɔmɔste.**
editor	sir,	with-respect	salute-you.

apəṇəŋkə	bəḍə	pətrikare	e	hətəbhagyə
apɔṇɔŋk	**βɔɽɔ**	**pɔtrikare**	**e**	**ɦɔtɔβʱagyə**
your	big	magazine-in	this	unfortunate

bideʃiːrə	choʈəkətha	pa-ĩ	sthanə	əchi	ki	nahĩ
βiðesir	**choʈɔkɔtθa**	**pãĩ**	**sthanɔ**	**ɔcʰi**	**ki**	**nãĩ**
traveller-of	small-talk	for	place	is	or	not

jaṇe	ni	təthapi	bhərəsa	səmpadəkəŋkə
ʒãṇẽ	**nĩ**	**tɔtθab̥i**	**βʱɔrɔsa**	**sɔmpadɔgɔŋk**
know	not	yet	hope	editor-of

səhanubhuti	bodhəhu-e	mũ	həra-ini.	apəṇəŋku
sɔɦanuβʱuti	**βoðɦue**	**mũ**	**ɦɔraini.**	**apɔṇɔŋku**
sympathy	perhaps	I	lost-not.	you-to

əhi	ciʈhi	khəɳɖi	lekhi	sethiru	əneka
ei	**ɔiʈhi**	**kˣhɔɳɖi**	**lekçi**	**setθiru**	**ɔnek**
this	letter	piece	writing	that from	much

labhə	uʈha-ibi	boli	bhabuchi.	ehi	khəɳɖi-e
laβʱ	**uʈhaiβi**	**βoli**	**βʱaβucʱi.**	**ei**	**kˣhɔɳɖie**
benefit	raise	for	thinking.	this	piece

ciʈhirə	ʃəhə	ʃəhə	chatra	chatri :,
ciʈhre	**sɔ**	**sɔ**	**chatrɔ**	**chatri,**
letter-in	hundred	hundred	students	lady-students,

səhəkərmi :	ʃikʂəkə	səməstəŋku	uttərə	debapa-ī
sɔʱɔkɔrmi	**siççʰɔkɔ**	**sɔmɔstɔŋku**	**utɔr**	**deβapāī**
colleagues	teachers	everybody-to	reply	give-for

cesʈa	kəruchi.	morə	priyəkərməsthəɭi :
cesʈa	**kɔrucʰi.**	**mor**	**priɔkɔrmɔstθɔɭi**
attempt	doing.	my	dear place of work.

priyəbəndhu	o	chatrə	chatrimanəŋku
priɔβɔnðʱu	**o**	**chatrɔ**	**chatrimanɔŋku**
dear friend	and	boy-students	lady-students

chaɖi	asilabeɭe	ja-uchi	boli	kəhi	parini.
chaɽi	**asilaβeɭe**	**ʒaucʰi**	**βoli**	**kɔɦi**	**parini.**
leaving	coming-time	going	that	say	could not.

ba-iʃi	sepʈembərəre	tarə	pa-ili,	əɳətiriʃə
bais	**sepʈembɔrre**	**tarɔ**	**pailli,**	**ɔɳʈris**
22nd	September	wire	received.	29th

sepʈembərəre	bəmbere	uɖajahajə	dhəriba	pa-ī
sepʈembɔrre	**bɔmbere**	**uɽaʒaɦaʒ**	**ðʱɔriβa**	**pāī**
September-in	Bombay-in	plane	catch	for

akhi	pa-ila	nahī.	kəʈəkə	səhərəre	paʃəporʈə
akçi	**paila**	**nāī.**	**kɔʈɔk**	**sɔɦɔrre**	**paspoʈ**
eye	reached	not.	Cuttack	town-in	passport

ɖheɳkanaɭəre	ghərə,	səmbələpurərə	cakeri,
ɖheŋkanaɭre	**gɦɔrɔ,**	**sɔmbɔlpurre**	**cakeri,**
Dhenkanal-in	home,	Sambalpur-in	service.

dine nuhe, du-i dinə nuhe, tinibərṣə pa-ĩ
dinẽ nũɦẽ, dui ðin nũɦẽ, tiniβɔrs pãĩ
one-day not, two day not, three-years for

deʃantərə. kahaku kəhibi, kahaku nə
desantɔrɔ. kaɦag̊u kɔɦiβi, kaɦag̊u nɔ
country-barred. Whom will say, whom. not

kəhibi ṭhikə kəri parili nahĩ. əṇəniʃwasi ho-i
kɔɦiβi ṭhik kɔri parli nãĩ. ɔṇɔniswasi ɦoi
will-say decision could not. breathless being

səbu kamə sari səmbələpurəru bəmbe
sɔβu kamɔ sari sɔmbɔlpurru bɔmbe
all work finishing Sambalpur-from Bombay.

əbhimukhəre gaḍi dhərilabeḷe khub kəmə
ɔβʱimukˣhɔre gaɽi ðʱɔrilaβeḷe kˣhub kɔm
towards-face-in train catching-time very few

lokəŋku bhiṭili. ketejəṇə səhəkərmi: o chatrə.
log̊ɔŋku βʱeṭili. keʤɔṇɔ sɔʱɔkɔrmi o chatrɔ.
people-to met. few colleagues and student.

je-ũ manəŋkəṭhu bidayə ne-i parili nahi,
jẽũ manŋkṭhu βiðayɔ nei parli nãi,
whom all-from farewell taking could not.

sudurə ləṇḍən səhərəru semanəŋku bidayə
suður lɔṇḍɔn sɔɦɔrru semanɔŋku βiðayɔ
very-far London city-from them-to farewell

prəṇəti snehə o ʃrəddha jəṇa-uchi. morə
prɔṇɔti sneɦɔ o srɔðɦa ʒəṇauchʰi. mor
salute affection and love conveying. my

bidayə beḷare je-ũmane snehə o səhanubhuti
βiðayɔ βeḷare jẽũmãnẽ sneɦɔ o sɔɦanuβʱuti
farewell time-in those affection and sympathy

de-ichənti semanəŋkə nikəṭəre mu ruṇi.
deichʰɔnti semanɔŋk nikɔṭre mũ ruṇi.
gave them to I indebted.

TEXT I

WIFE. It said in 'Dipika' that Nilamani Senapati has sailed for 'Bilat'. Where is 'Bilat'?

HUSBAND. Don't you know where 'Bilat' is! It's called London in English. London is a city and is the capital of England.

WIFE. What's a capital?

HUSBAND. Where the King lives is called the capital. Cuttack is the capital of Orissa, Calcutta of Bengal, Delhi of India and London of the British Empire. So where the King lives is the capital.

WIFE. Who is our King?

HUSBAND. The present King is George the Sixth.

WIFE. Where does he live?

HUSBAND. In England.

WIFE. Then London is the capital. Why did you mention Cuttack, Delhi and Calcutta as capitals?

HUSBAND. Because the representatives of the King live in those cities.

WIFE. What's a representative?

HUSBAND. Well, the sun never sets on the British Empire. Wherever the sun may go, there they have their empire. But such a great king is only one man, so how can he administrate alone? He has appointed governors who carry on administration on his behalf. There are many officials: every district has a magistrate, above him is a commissioner, above him the governor, and above all the governors is the Viceroy. There are hundreds of clerks and officials under

them. The Viceroy is known as the 'Badalat'. Each official has a given status. The higher official superintends the work of the one under him. In England, there is an assembly called Parliament. The King cannot undo the decisions of the Parliament. There is a Cabinet for India also. The Cabinet controls the Viceroy. The Indian officials have to act upon the orders of that Cabinet.

Text II

LONDON LETTER

Dear Editor,

Respectful salutations.

I do not know whether there is space in your great paper for the trifles of this poor traveller. Still I hope I have not lost the editor's sympathy. I am thinking that the writing of this single letter will be useful in many ways. In it, I am trying to reply to hundreds of my students, teachers and colleagues. I was unable to take leave of my beloved friends and students when I left my dear work place. I received a wire on 22nd September and did not see how I could catch the plane at Bombay on the 29th. The passport was in Cuttack, my home in Dhenkanal, my work at Sambalpur, and it was not a matter of leaving for a day or two, but for three long years. I could not decide whom to meet and whom not. When I had finished all my work, and boarded the train, quite breathless, at Sambalpur, I could only manage to meet a very few people—among them some students and some colleagues. I convey from here my love and affections to all those of whom I could not take leave. I am greatly indebted to those who have expressed their love and sympathy at the time of my farewell.

APPENDICES

ORDER OF KYMOGRAMS

Mouth Tracings

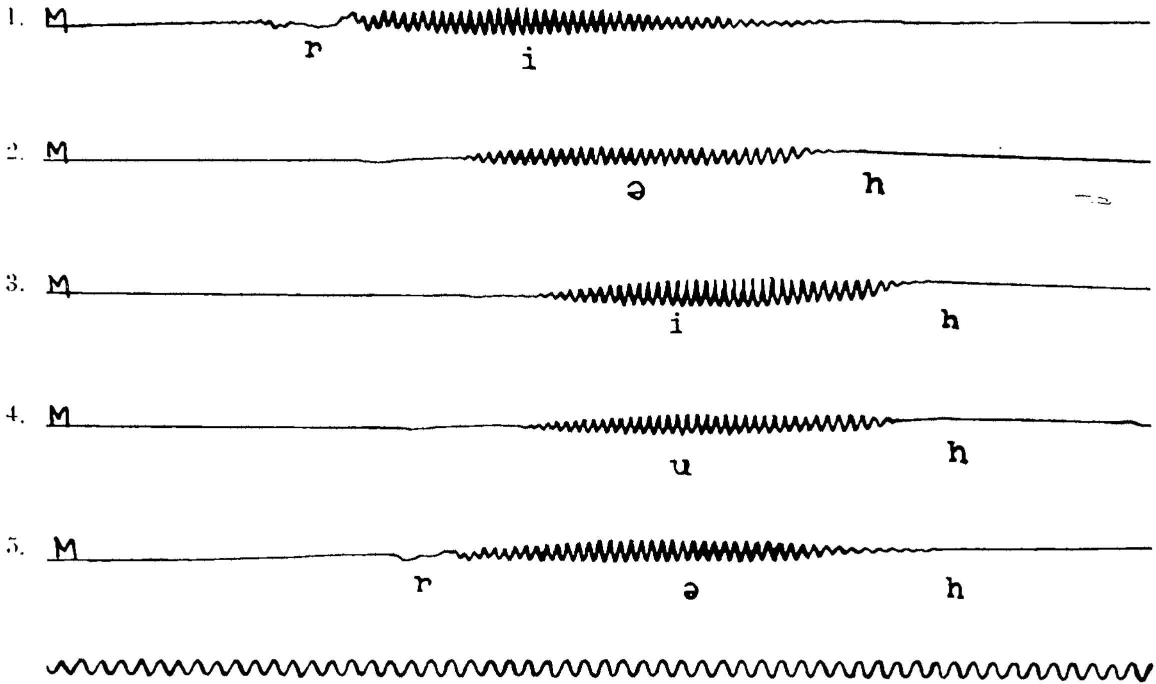
1. ri
2. oh
3. ih
4. uh
5. rəh
6. kha
7. ka
8. tha
9. chu
10. ṭho
11. phi
12. pi
13. phri
14. poch
15. uṭh
16. uṭhə
17. ḍhi
18. ghra
19. bhru
20. ərha
21. olha
22. phopha
23. ghogho
24. gəphutha

Nose and Mouth Tracings

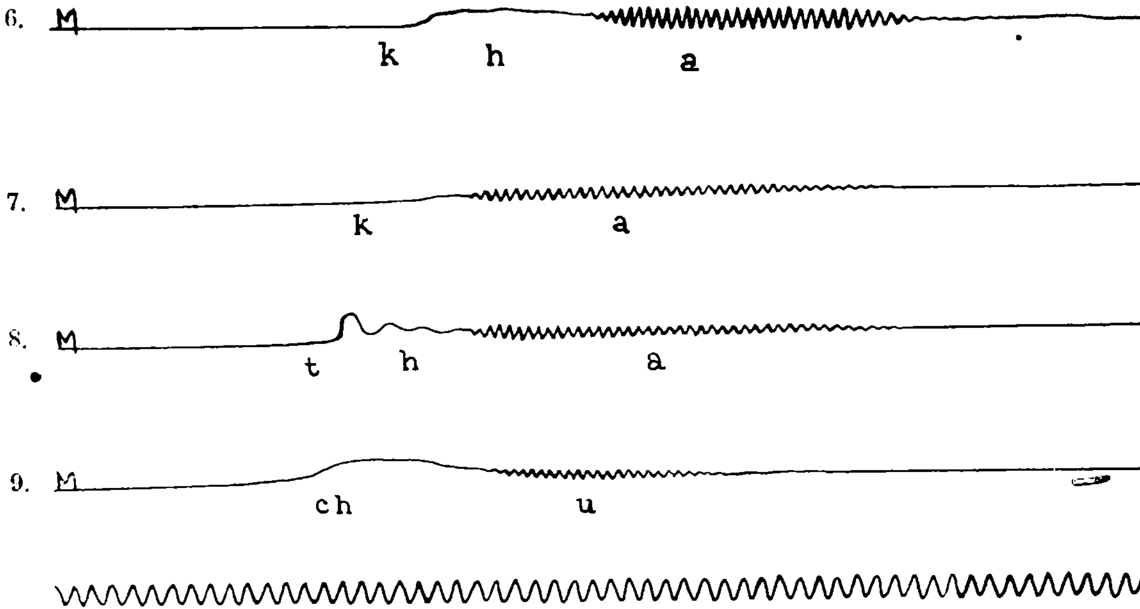
25. hɔ̃
26. khã
27. khĩ
28. jhĩ
29. gəmha
30. bəhni
31. ghənə
32. hu

Larynx and Mouth Tracings

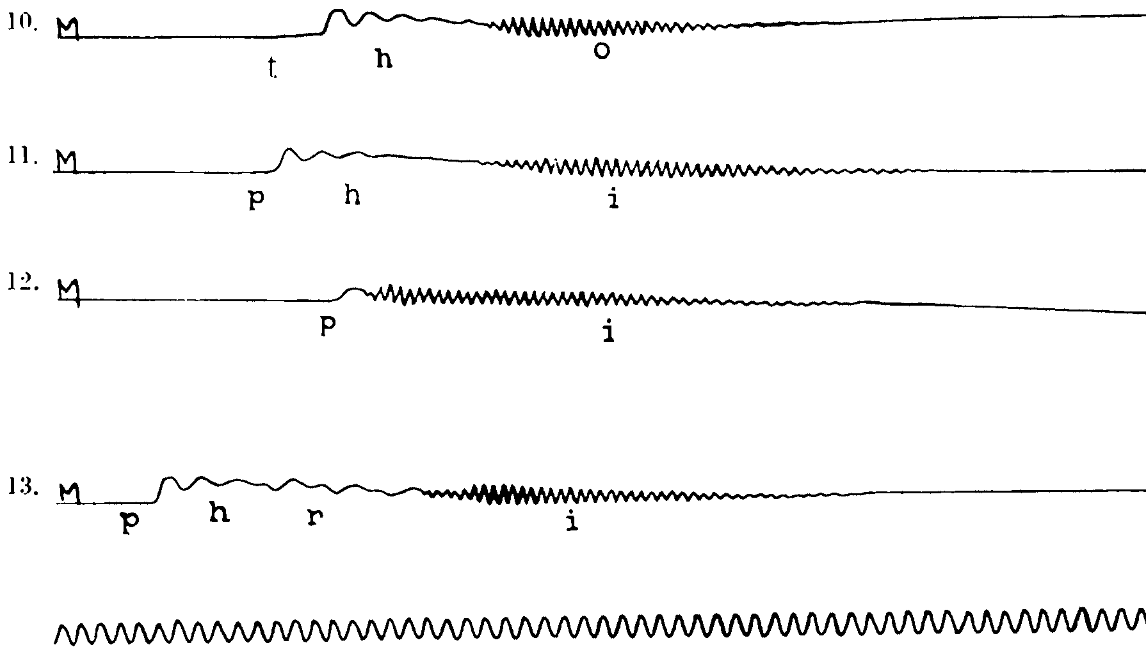
33. hri
34. hi
35. gha
36. bodh
37. baḍh
38. labh



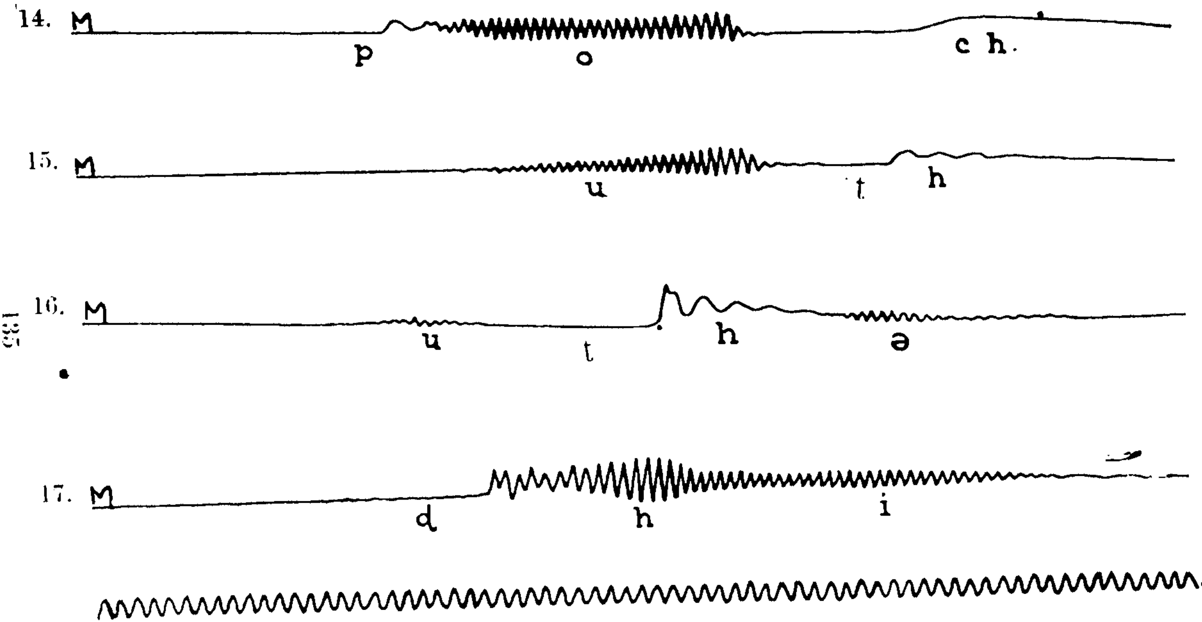
Kymograms : Mouth Tracings



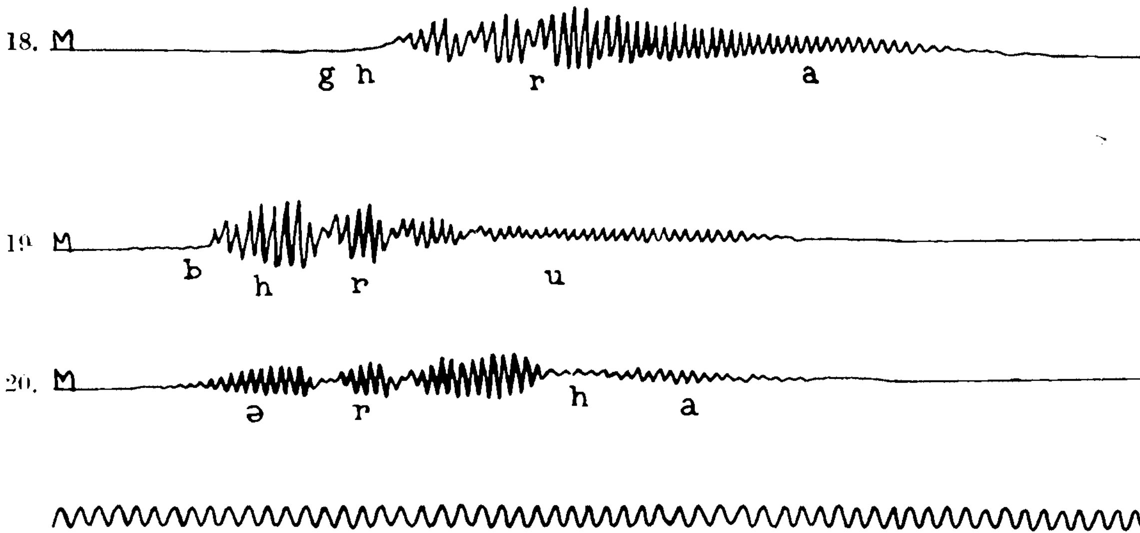
Kymograms : Mouth Tracings



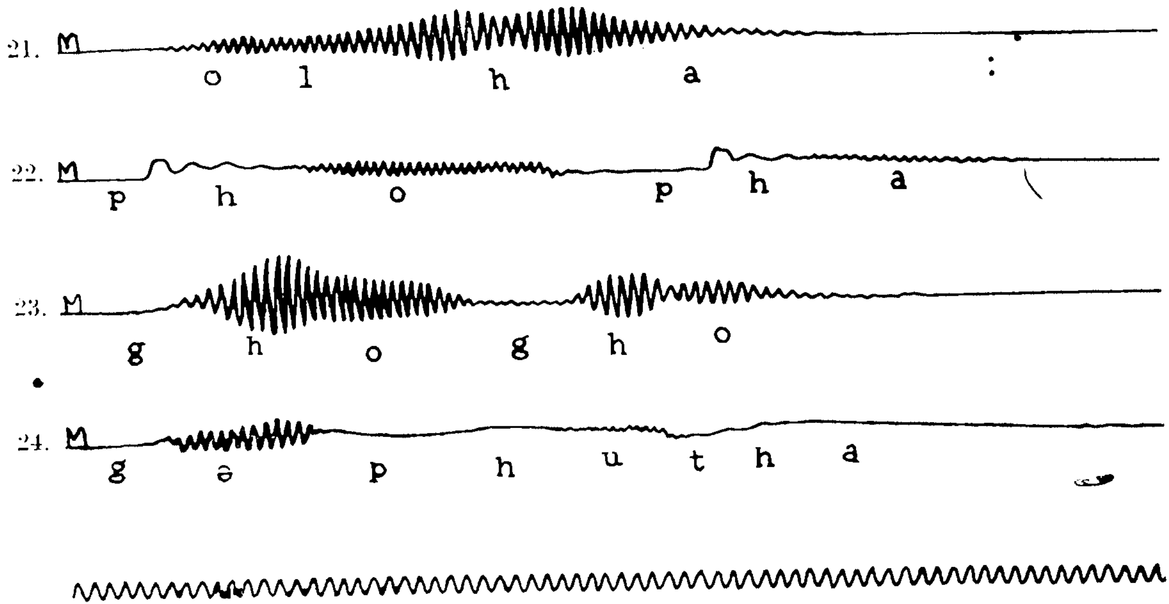
Kymograms: Mouth Tracings



Kymograms: Mouth Tracings

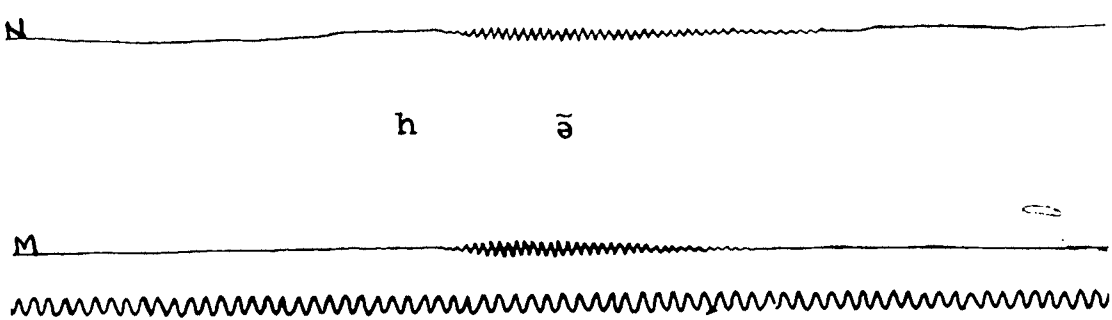


Kymograms: Mouth Tracings

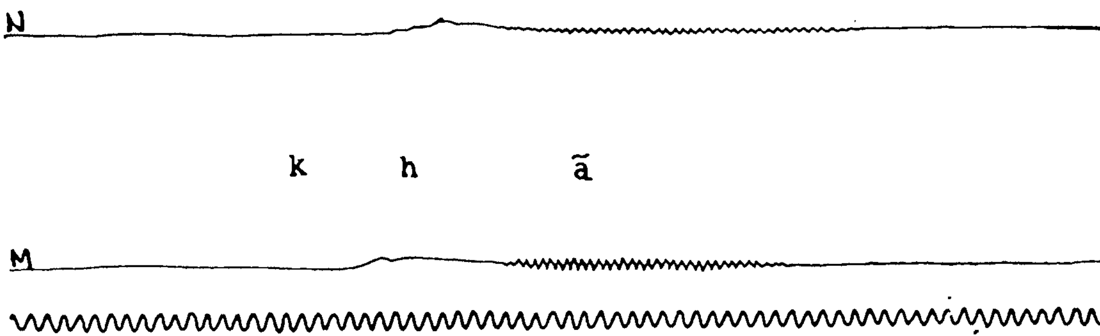


Kymograms: Mouth Tracings

25.

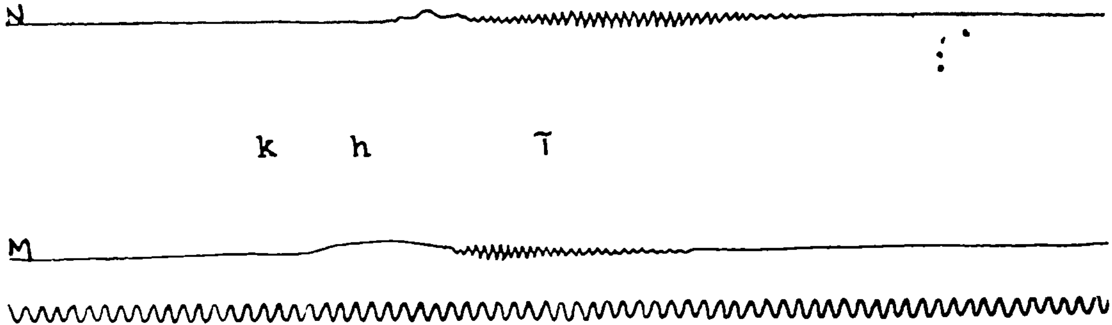


26.

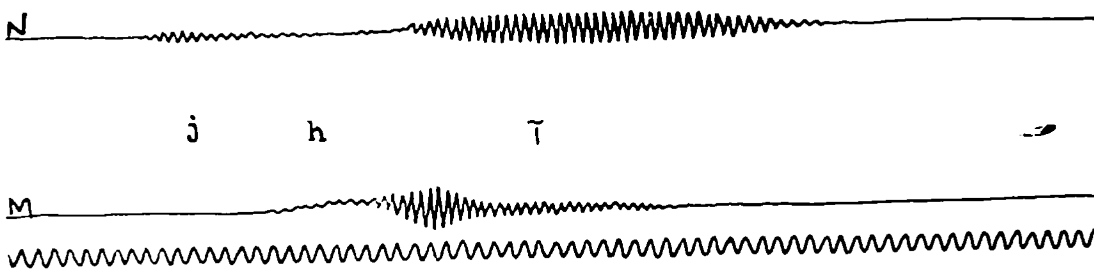


Kymograms: Nose and Mouth Tracings

27.

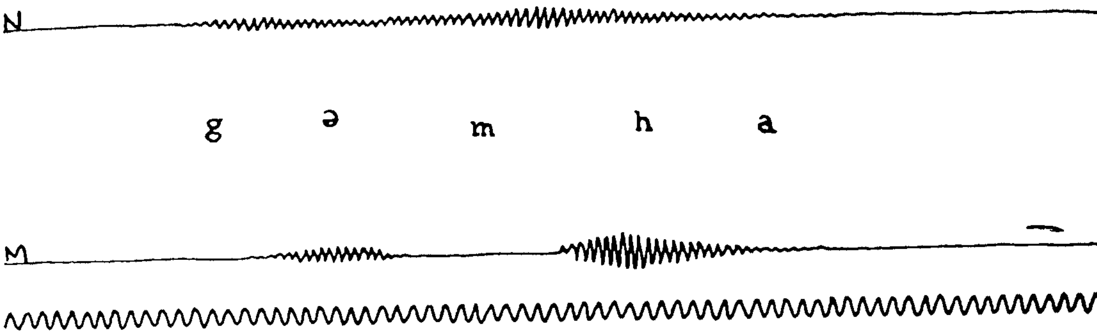


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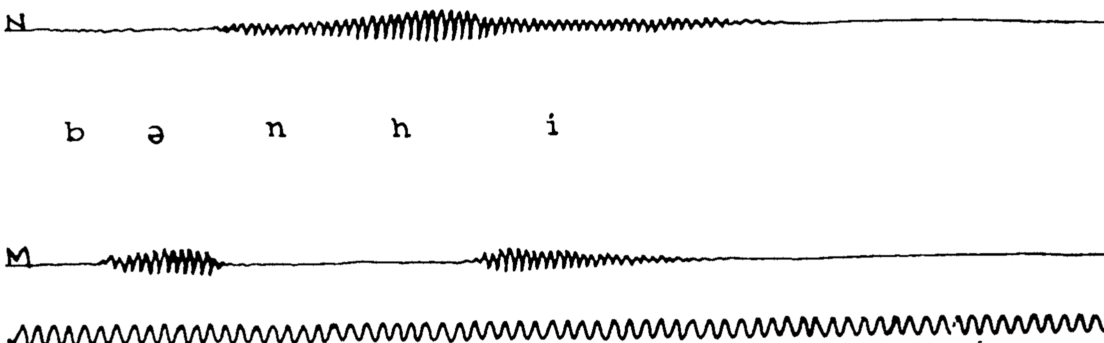


Kymograms : Nose and Mouth Tracings

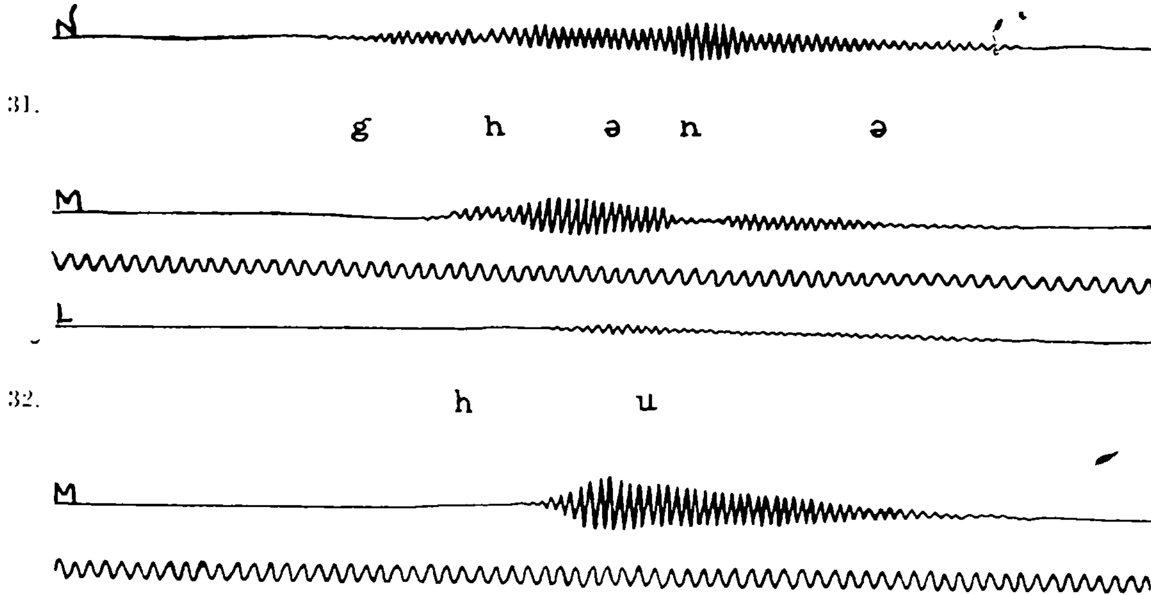
29.



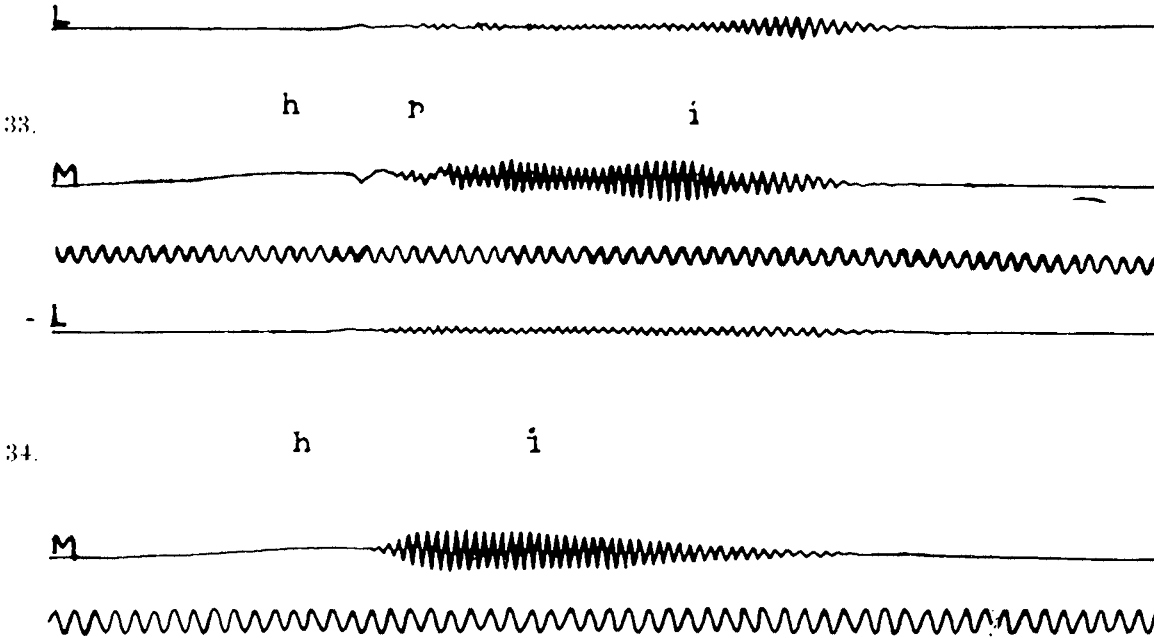
30.



Kymograms: Nose and Mouth Tracings

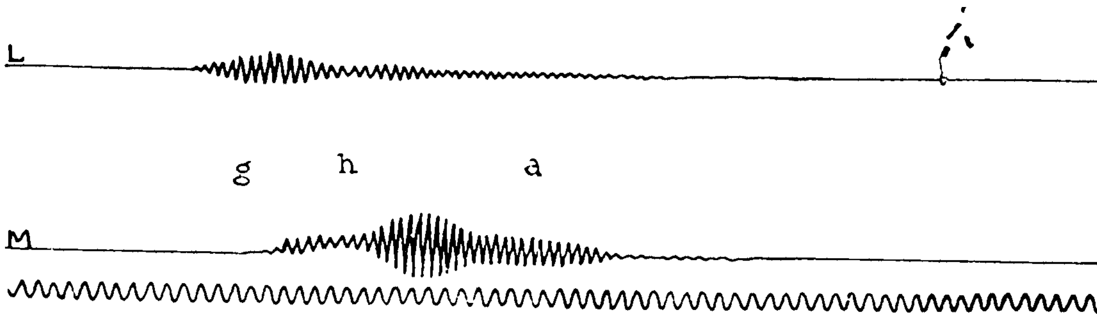


Kymograms : Nose and Mouth Tracings

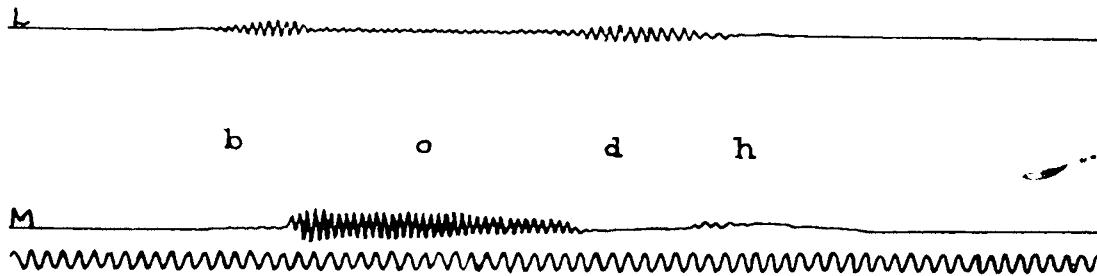


Kymograms : Larynx and Mouth Tracings

35.

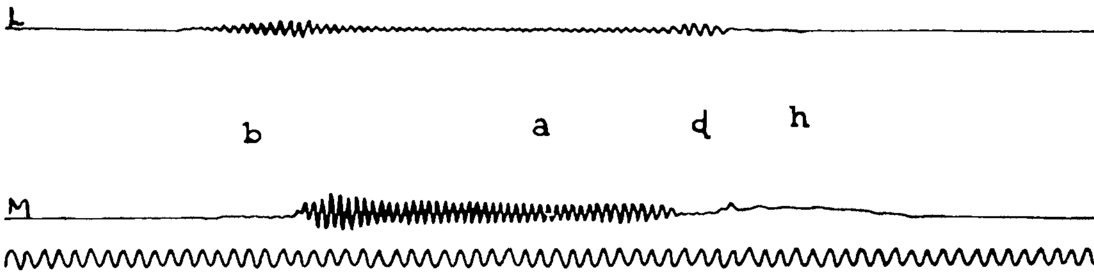


36.

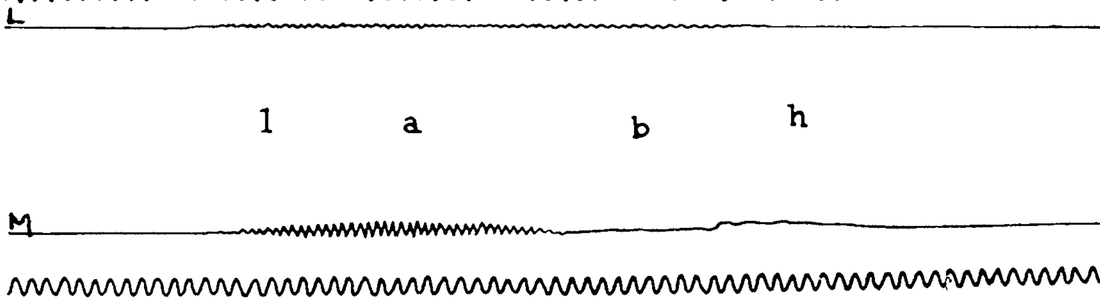


Kymograms: Larynx and Mouth Tracings

37.



38.



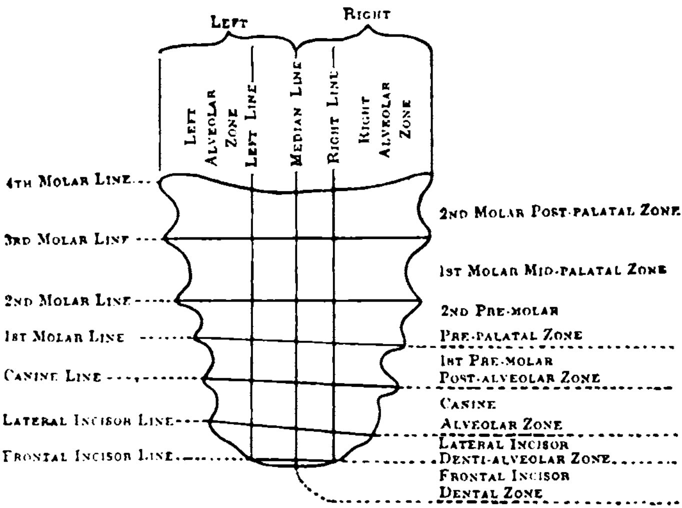
Kymograms: Larynx and Mouth Tracings

ORDER OF PALATOGRAMS

1. ta
2. tha
3. ja
4. jha
5. cu
6. chu
7. ṭa
8. ṭha
9. uṭh
10. uṭhə
11. poch
12. pochə
13. ṭhi
14. ḍhi
15. ḍhə̃
16. ḍhə
17. pəḍh
18. pəḍhə
19. əra
20. ərha
21. əla
22. əlha
23. bahyə
24. bajyə
25. bəni
26. bəhni
27. khəma
28. kṣəma
29. i
30. əkha
31. akhi
32. paṭhə
33. paṭhyə
34. ərghə
35. ərghyə
36. adhyə

Diagram of the palate showing the zonal divisions

The following diagram is given to illustrate the technique and the categories that have been employed in the study of articulations in the thesis, based on new lines of palatographic investigations as indicated by Firth in his 'Word palatograms and articulations', *B.S.O.A.S.*, Vol. XII, Parts 3 and 4, 1948, pp. 857–64.



The zones	*The grouped zones*
Dental Denti-alveolar	Dental
Alveolar Post-alveolar	Alveolar
Pre-palatal Mid-palatal Post-palatal	Palatal

10B



1. ta



2. tha



3. ja



4. jha



5. cu



6. chu



7. t̪a



8. t̪ha



9. ut̪h



10. ut̪hə



11. poch



12. pochə



13. ṭhi



14. ḍhi



15. ḍhə̃



16. ḍhə



17. pəḍh



18. pəḍhə



19. əra



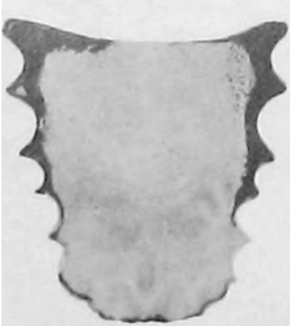
20. ərha



21. ola



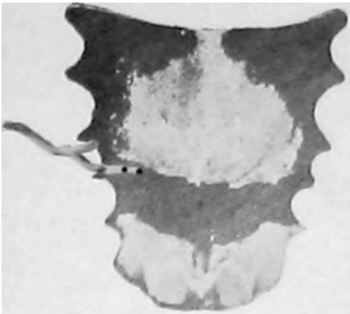
22. olha



23. bahyə



24. bajyə



25. bəni



26. bəhni



27. khəma



28. khəma



29. i



30. əkha



31. akhi



32. paʈhə



33. paʈhyə



34 ərghə



35. ərghyə



36. aɖhyə

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This book is the first of its kind to deal with the phonetics of Oriya. Though it deals at length with one aspect of the language, that is aspiration in Oriya, yet it is a fine introduction to a general understanding of Oriya phonetics. In this work phonetic statements are based on the perception techniques of observation and record and are supported by palatographic and kymographic evidences, or by both, specially keyed to the analysis. To write this book which was submitted as a thesis for the M.A. degree of the University of London in 1951, the author spent two years in the said university and had training in linguistics and laboratory techniques available there. This piece of pioneer work in the field of descriptive linguistics of Oriya should be of interest to linguists in general and phoneticians in particular.